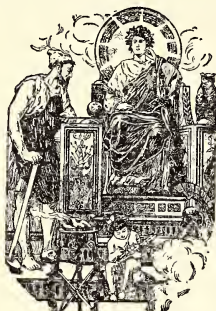


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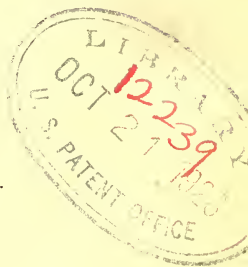
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Professor of Pharmacy in the Philadelphia College of Pharmacy.

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AMERICAN JOURNAL OF PHARMACY.

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JANUARY, 1857.  
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INVESTIGATION AND EXAMINATION OF A BARK RECENTLY
INTRODUCED INTO THE DRUG MARKETS OF NEW YORK
AND PHILADELPHIA, AND OFFERED FOR SALE AS THE
GENUINE WINTER'S BARK.

By E. S. WAYNE, Cincinnati.

Upon a recent visit to the East, I was shown by Mr. Edward Parrish, of Philadelphia, a specimen of a bark which he informed me was offered for sale by one of the drug houses of that city as the genuine Winter's bark. My opinion was asked, at the same time, concerning it; whether it was Winter's bark or not; if not, was I acquainted with it, and what was the name and origin of it? From the appearance of the bark it was easy for any one acquainted with that of the genuine Winter's bark, to decide at once that it was not the same; but what it was, or its origin, we were unable to tell. Meeting afterwards with Prof. Wm. Procter, I questioned him concerning the same, and found that he was also unacquainted with it.

A few days after my interview with Mr. Edward Parrish, I again met my new acquaintance in the drug house of Mr. Geo. W. Lawrence, of New York. Upon recognizing it I inquired what it was, and was informed that it was Winter's bark. Feeling somewhat curious concerning it, I made a number of inquiries, with the hope of obtaining some clue to its origin; the only point I could, however, ascertain concerning it was, that it was imported from the west coast of South America. By permission, I selected about a pound of the bark, which I took home with me, with the intention of examining its proximate constituents,

and, with the aid of authorities, to ascertain its botanical origin, and have met with the following success :—

In the London Journal of Pharmacy, vol. iii, page 169, will be found an article, by Dr. Alexander Ure, upon the South American bark called the Malambo or Matias bark, a short extract of which will be found in the appendix to the U. S. Dispensatory, page 1349. Dr. Ure states in his paper, that Malambo or Matias bark is the product of a tree in Colombia, S. A., and that it was placed in his hands by Hugh Houston, Esq., which gentleman received it from Dr. Mackay, who communicated two papers respecting it to the British Association, and mentions having procured from it by distillation two oils, one lighter than water, of a specific gravity 0.949; the other denser, of a specific gravity 1.028. He further obtained a brown, bitter extractive substance. Dr. Mackay remarked, that it had been successfully used in intermittent fever, in convalescence from continued fever, in hemicrania, dyspepsia, and a variety of chronic ailments, where tonics and stimulants were indicated; and that as an adjunct to diuretic remedies, it had been found eminently useful.

Dr. Ure describes the Malambo or Matias bark to be three or four lines in thickness, brittle, though somewhat fibrous; emitting when fresh bruised an aromatic flavor, not unlike that of calamus; color of a brown hue, covered with an ash-colored tuberculous epiderm, and possessing a bitter pungent taste. With water it forms an agreeable bitter infusion; with alcohol, a powerful bitter tincture. Ether extracts from it volatile oil and resin. Heated along with hydrate of potash, free ammonia is disengaged, indicating the presence of an azotized principle. It is without astringency. It appears to coincide, as suggested to me by M. Guibourt, both in regard to physical and sensible properties, with Malambo, the Indian name for the bark of a tree which grows in New Granada, and which is held in high esteem among the natives as a febrifuge and stomachic.

Malambo bark was analysed by M. Cadet Gassicourt, about twenty-eight years ago (*Journ. de Pharmacie*, tom. ii, p. 172); subsequently by M. Vauquelin, who ascertained the presence of three distinct substances, namely: 1. An aromatic volatile oil. 2. A very bitter resin. 3. An extract soluble in water, which

yielded ammonia when heated with caustic potash. (*Annales de Chimie*, tom. xvi, p. 113.) It afforded no tannin, scarcely a trace of gallic acid and none of the alkalies of cinchona. It is stated, in the countries where the tree is indigenous, incisions are made in the bark, and there exudes an aromatic oil which sinks in water. Most authors believe it to be the produce of a species of drymis, but M. Bonpland regards it as a quassia. (*Merat. et de Lens. Dictionnaire de Mat. Med.*, tome iv. p. 199.) This, however, is improbable, since none of the quassia tribe yet discovered are possessed of aroma.

Dr. Ure further mentions in his paper, that he has used the Malambo bark with good effect. That it offers the useful combination of a tonic and aromatic; and seems to exercise its beneficial influence upon the principle laid down by Professor Schultz, with regard to other therapeutic agents of the same class, namely, in promoting an increased flow of bile, whereby digestion is perfected, and healthy blood formed. In scrofulous ophthalmia, after removing feculent accumulations from the bowels, I have known an infusion, made with two drachms of the bark to a pint of water, cause a speedy and complete removal of the inflammation and morbid sensibility of the eyes. The dose of the infusion just mentioned, is from one to two ounces, repeated twice or thrice in the course of the day. It may, in some instances, be advantageously conjoined with salts of iron or mercury, with both of which it is compatible. The addition of a little syrup of orange peel and compound tincture of cardamom, forms a draught by no means disagreeable.

In volume vi. of the same journal, page 255, will be found another paper upon the same bark, by W. Hamilton, M. B., in which he mentions that as far back as 1825, he received a portion of bark under the name of Malambo, from Mr. Edward Watts, Esq., British Consul at Carthage, accompanied by extracts from some of the Spanish writers on the natural history and productions of that province, detailing its medicinal properties, but without furnishing any clue to the localities in which it is found, or the botanical characters of the tree from which it is obtained; and mentions that he turned with some eagerness to Dr. Ure's paper, in the hope of meeting in it some information which he failed to procure from other sources, but was disap-

pointed in his expectations. Dr. Hamilton regrets his inability to throw more light upon this part of the subject (*i. e.* the botanical) than those who had preceded him; but, as connecting links in the history of a substance, which, although known in Europe for upwards of thirty years, still slumbers in mysterious obscurity, and is far from being appreciated to the extent of its merits, gives the following fragments of its local history: In a work on the natural productions of the province of Carthagena, by Don Jorge Lopez, the date of which he did not unfortunately possess, that writer states: A tree exists in the province of Carthagena, of the stature of cinchona, called the Malambo, whose bark, in my opinion, possesses qualities far superior to those of cinchona. It abounds in an aroma so durable and penetrating, that it is not impaired by lapse of time, and must, therefore, I imagine, consist of gummy particles of great value to man. It is a native of this province, and very abundant. I speak of its bark, and were the Faculty to employ it, cinchona would sink into disrepute. It is employed with known advantage in this country in the treatment of various complaints, especially in spasms, wounds, inflammations, and disorders of the stomach. It would, I think, be highly beneficial in cases of dropsy, and malignant fevers. Experience has proved its efficacy in asthma, rheumatism, dysentery, and menstrual obstructions, in my own practice. In fine, here, and in the country especially, it is a universal remedy, employed with the happiest effects in all the above named complaints."

From another rare and valuable Spanish work, in the possession of Mr. Watts, Dr. Hamilton obtained the following extracts:—

"The third is the Malambo, whose aromatic bark is a powerful anti-spasmodic, containing bitter febrifuge and astringent properties of great activity. It abounds in the province of Santa Martha, where it is employed in the cure of spasms, intermittents, calentures, and dysenteries; it occurs also in various parts of this province, (Carthagena.) The bark is exported to the Havanna, where it is exhibited in the treatment of spasms, (tetanus,) to which the negroes are very subject; and since the adoption of this remedy, hardly any deaths arise from the complaint. Here we make no use of it; and very lately (in 1810,

at Carthagena,) we have witnessed the death of a valuable young man from the neglect of exhibiting this remedy in sufficient time. It is a most important vegetable production, meriting the attention of government from the valuable properties it possesses, and the use made of it at Santa Martha. Both from the color and smell of the bark it would appear to belong to the genus *Cusparia*, or the *cinchona* of Angostura, which entered into the prescription of the late Dr. Mutés for the cure of dysentery; and we have no hesitation in saying that the bark of the Malambo may supply the place of that of the *cusparia*."

In volume ix. of the same journal, page 463, is an article by James Stark, M. D., upon copalchi bark. He mentions that in the course of some inquiries into the remedies used in Chili and Peru, that he received from one of his correspondents in Chili a bitter bark, under the name of Natri, which was stated to be much used by the medical practitioners and natives of Chili, in the treatment of intermittent and other fevers, and held in higher repute than even Peruvian bark itself. The bark and leaves sent me enabled me to ascertain that the Natri was the produce of a species of *Croton*, but from the want of the flowers and fruit, the particular species could not be determined. Also that in the course of a correspondence with a friend, he was informed that a quantity of the bark had been received by a house in London from San Blas, which appeared to be identical with the Natri. A small quantity of the bark had also been brought over by a gentleman from Santa Cruz, who states that it was there known under the name of Chiniquie, and was always given to Indians in fever cases, and was considered by the medical practitioners there as superior in certain cases to *cinchona* bark itself.

Mr. Howard at once recognized this bark as the copalchi bark of Goebel, a valuable Mexican bitter, described by him as the product of the *Croton suberosum*. Dr. Stark says, that he is satisfied that this bark (Natri) is the bark known since 1825 in Europe, and described under the names of Copalchi bark and Quina blanca, the product of one tree, variously termed *Croton suberosum* by Humboldt, Bonpland, Kunth, &c., *Croton pseudo*, China by Schlechtendal and Nees von Esenbeck; and *Croton cascarilla* by Professor Don. Dr. Stark has made a number of

trials of this bark, and the administration of it at his hands has been very satisfactory. (See article.)

This bark was examined by Mercadieu in 1825, who found it contain no crystallizable alkaloid. Brandes, in the year following, who failed also to detect any crystallizable alkaloid, but recognized the bitter principle on which its active properties depend, a resin, concrete fatty oil, &c.

Mr. Howard made some trials to prepare the bitter principle in a pure state. The bark was exhausted by alcohol, the tincture evaporated to dryness, and the bitter principle removed from this extract by cold water, and upon the evaporation of the water the bitter principle was obtained in dark brown, almost black, lustrous but non-crystalline scales of an intensely bitter taste.

I shall now attempt to sum up what information I have gleaned that has any bearing upon the bark in question; and the query might be made, what has the Malambo bark described by Ure and Hamilton, and the Copalchi by Stark to do with it? My object is by the similarity of the medicinal value, their origin and proximate constituents to prove the identity of the Malambo with the Copalchi bark described by Stark and Pereira in his work upon *Materia Medica*, as Corky Copalchi, the product of *Croton suberosum*.

And, having done this, to show that the bark I have mentioned in the beginning is identical with the Malambo, consequently the Copalchi.

Now let us examine first, the statements concerning the medicinal value and uses of the Malambo and Copalchi barks, as mentioned by Drs. Ure, Hamilton and Stark; they are so similar that I think it is impossible to doubt their identity.

In Dr. Ure's paper, it is stated that the Malambo has been successfully used in intermittent fevers, in convalescence from continued fevers, and in a variety of chronic ailments where tonics and stimulants were indicated, and that in New Grenada it was held in high esteem by the natives as a febrifuge and stomachic.

Dr. Hamilton, in his paper upon the same, fully endorses the statement of Ure, and quotes from Spanish authority to the same effect, &c.

Dr. Stark says of the Copalchi bark, that the medicinal practitioners of Chili, in the treatment of intermittent and other fevers, esteem the bark more valuable than the cinchona, and that he had administered it himself, and found it to be useful in atony of the stomach and bowels, with weak and imperfect digestion and irregular action of the bowels; and, in such cases, found it superior to the usual bitters, as gentian, quassia, Peruvian bark, &c.

Next, as to the sources of the bark and its botanical origin, Dr. Ure states that it is obtained from a tree in New Granada. Dr. Hamilton quotes from Spanish authors who state, that it is found in the province of Carthagena, and is of common occurrence, and may, no doubt, be found throughout the whole littoral chain, which stretches from the Punta Paria in the East to the Gulf of Maracaibo, and thence westward through the provinces of Santa Martha and Carthagena to the Gulf of Darien; and, as the flora of Trinidad is but an extension of that continent, it is by no means improbable that it is a denizen of those forests. The Copalchi is common in Chili and Peru, and in the drug shops of Jalapa, and Pereira mentions a shipment of this bark from Peru to Hamburg through Liverpool in 1827, part of which was shipped at Pataya and Guyaquil. Of the botanical description of these barks I can glean no positive information. Dr. Ure says, that authors believe the Malambo to be a species of drymis, but that M. Bonpland regards it as a quassia, and remarks that the last is impossible, as none of the quassia tribe yet discovered are possessed of any aroma. In Stark's paper, it is, upon Spanish authority, said to resemble, both from color and smell, the genus *Cusparia*, or the cinchona of Angostura, which entered into the composition of the prescription of the late Dr. Mutés for the cure of dysentery.

Although he has not been able to lay his hands upon the description of Goebel, Dr. Stark says he is satisfied that the Copalchi is the same bark known in Europe since 1825, and described under the names of Copalchi and *Quinia blanca*, the product of one tree, known as the *Croton suberosum* by Humboldt, Bonpland, Kunth, &c., *Croton pseudo-china* by Schlechtendal, &c., and *Croton cascarilla* by Prof. Don. The medicinal properties attributed to these barks in South America, its general

use, its wide geographical range, are strong points as to their identity.

We have, in the papers mentioned, but one physical description of the bark given, that of Dr. Ure. He states that it is three to four lines thick, brittle, though somewhat fibrous; emitting, when fresh bruised, an aromatic flavor, not unlike that of calamus. It is of brown hue, covered with an ash-colored, tuberculous epiderm; it possesses a bitter pungent taste. This description is similar to that given by Pereira for the Corky Copalchi, and in every particular answers the description of the bark I have in my possession, obtained in New York.

Now let us examine the chemical examination of these barks and the products obtained.

Malambo bark, analysed by Gassicourt, yielded: 1st. An aromatic oil (volatile). 2d. A bitter resin. 3d. An extract soluble in water, which yielded ammonia when heated with caustic potas. It afforded no tannin, scarcely a trace of gallic acid and no alkaloids.

The Copalchi bark analysed by Brandes, yielded a resin, concrete fatty oil, a bitter principle, on which its activity depends, but no alkaloid. Mercadieu found in it an astringent matter of deep brown color, an exceedingly bitter principle, no alkaloid, &c. &c. Mr. Howard also has analysed it with similar results.

The bark I have in my possession has been submitted to the following operation: 1000 grains of the bark yielded by distillation an oil which floated upon water and another heavier, which sank in water; it was bitter to the taste, and had the peculiar odor of the bark when bruised. 2d. Four ounces of the bark in coarse powder was treated with alcohol in a displacer, a dark brown tincture was the result; this was then evaporated upon the water bath, and water added as the spirit evaporated; upon cooling, a dark colored oil was found floating upon the surface, and a dark oleo-resin deposited upon the bottom of the dish. The oil floating upon the surface was carefully collected, and weighed 27 grains. The oleo-resin also was collected, and weighed 56 grains. They both possessed an exceedingly bitter taste and the peculiar aroma of the bark. The watery portion of the operation had also a bitter taste; it was filtered to separate resin, &c. With sesqui salts of iron, it gave no indications of the pre-

sence of tannin. To it acet. of lead was added as long as it gave a precipitate, then filtered and sulphydric acid passed through it to precipitate the excess of lead salt used, filtered and mixed with half its volume of ether and agitated for some time. After standing some time, to allow the ether to separate, it was poured off and left to spontaneous evaporation. A light yellow substance insoluble in water, soluble in alcohol and of an exceedingly bitter taste, was the result. I intend to treat it at some more convenient season, after the method of Duval for obtaining cascarillin, which bark (cascarilla) it much resembles, as far as its proximate constituents are concerned, and perhaps, also, its medicinal properties. We here find, also, a close similarity in the Malambo, the Copalchi and this unknown (to me) bark. Like the Malambo, it apparently contains no tannin, two oils of different specific gravity, a bitter principle, no alkaloid. The Copalchi resembles them, &c. And, to sum up the whole, the evidence is so conclusive to me, that I have no hesitancy in saying that the Malambo bark described by Ure, the Copalchi by Stark and Pereira as Corky Copalchi and the bark in question are identical.

Cincinnati, December, 1856.

REMARKS ON BOUTIGNY'S METHOD OF PREPARING PROT- IODIDE OF MERCURY.

By JOHN CANAVAN.

PROF. PROCTER:—*Dear Sir*,—In the last number of your Journal, there are some remarks on M. Boutigny's process for preparing the protiodide of mercury, by Mr. Bullock, which attracted my attention, as a similar result has taken place under my own notice, which I think I can explain, at least satisfactorily to myself.

Having always prepared the above salt according to M. Boutigny's formula, and with success, I was surprised, a few days since, by a quantity shown me, prepared by an assistant, which contained large globules of metallic mercury. As it was too late to examine the washings, (not having seen it until in the drying process,) I questioned the assistant as to the manner in which he proceeded; he replied, he went exactly according to the "di-

rections in the book." Of this I had some doubts, owing in part to the time occupied in the operation.

I therefore concluded that the calomel and iodide of potassium had not been thoroughly triturated together, and that decomposition had not fully taken place before the addition of hot water. I am confirmed in this opinion, as another quantity prepared from the same materials and by the same person, but with a longer and more perfect trituration, gave no such result, but yielded a perfect protiodide, in which metallic mercury could not be distinguished even with the aid of a microscope.

I think the same opinion will hold good in Mr. Bullock's case; that from the large quantity of materials used, and the great difficulty of reducing the iodide of potassium to a powder fine enough for each particle to be acted upon by a particle of calomel, is a great deal in favor of my theory, that double decomposition had not fully taken place prior to the addition of hot water; and owing to the large quantity of iodide of potassium found in the washings, it seems to me, was another proof that the process of decomposition was arrested by the too early addition of the hot water.

The metallic mercury I account for as follows: A portion of the calomel having parted with its chlorine, the base had not had time, as it were, to combine with the iodine of the iodide of potassium; the mercurial salt in solution, I presume, was a portion of the protiodide of mercury held there by the iodide of potassium; but as these are only suppositions, not having time to look into the matter more fully, I give them for what they are worth.

I have never found any difficulty in making the protiodide of mercury according to M. Boutigny's process in small quantities, and taking care to use a great deal of trituration; and I doubt much whether it can be prepared perfectly in large quantities, such as those used by Mr. Bullock, which would require a very large mortar and a great deal of labor. All the forms of M. Boutigny I have seen, give the proportions in drachms, which is as much, I think, as can be prepared at once.

New York, Nov. 7, 1856

ON PROTIODIDE OF MERCURY.

BY JOHN M. MAISCH.

The last Journal of Pharmacy, on page 517, contained some remarks by Mr. Bullock on Boutigny's process for the preparation of iodide of mercury. Wittstein's Vierteljahresschrift, V. 536, publishes a paper on a similar subject by Oscar Lichtenberg, who tried J. B. Sobry's new (?) process, published in the Journal de Pharm. d'Anvers, 1855, 609, which consists in the double decomposition of calomel and iodide of potassium under the aid of water. Mr. Lichtenberg treated finely levigated calomel with a *solution* of iodide of potassium, and obtained—what was to be expected—a mixture of the protiodide, protochloride and metallic mercury, and comes to the conclusion that by Sobry's process the desired preparation cannot be obtained. There is, however, another way of manipulating in order to insure the double decomposition, viz: rubbing the dry articles *well* together and afterwards treating them with water. These are Boutigny's directions, who employs *boiling* water for decomposition and washing.

The protiodide of mercury is a very easily decomposable body, not only by the light, but also by other agents, as the following few quotations will show. According to Otto, it has little constancy, and from different causes is divided into mercury and the biniodide or sesqui-iodide; such causes are the treatment with hydriodic acid, iodide of potassium and similar iodides. Mitscherlich says: When heated gradually, it decomposes into mercury and the red iodide; the same result is obtained on treating it with a solution of iodide of potassium or other substances that have an affinity for the red iodide. This decomposition, according to Mohr, takes place by the action of many chemical preparations, especially by boiling it with hydrochloric acid, the iodides, sal ammoniac and common salt.

If the protiodide of mercury is treated with a solution of iodide of potassium at ordinary temperature, it quickly assumes a dark green, almost black color; a solution of chloride of potassium produces ultimately the same change, but far less rapidly; but at a boiling heat the decomposition is perceptible instantly. The ordering of hot water, therefore, must appear

unwarranted, and the employment of cold water for the completion of the reaction between calomel and iodide of potassium ought to furnish a purer product; the iodide, as well as the chloride of potassium being very easily soluble in cold water; the reaction can take place at once in the finely powdered and well mixed mass and the resulted chloride removed by filtration and washing. If the iodide of potassium is not well mixed with the calomel, a portion of it, after the admixture of water, will come in contact with the newly formed protiodide, and decompose this before all the calomel has been decomposed; this, undoubtedly, was the case in Mr. Bullock's undertaking, and in this way only may be accounted for the large amount of the red iodide of mercury obtained from the mother waters.

In view of the above facts and inferences the following experiments were made:—

1. The mixed powder was rubbed with boiling hot water, immediately thrown on the filter and washed with warm water.

2. The powder was treated with cold water, occasionally stirred, filtered after half an hour, and washed with cold water.

3. After the rubbing with sufficient cold water, the product was instantly filtered and rapidly washed with cold water.

In all cases the precautions were alike, viz: the iodide of potassium was free of carbonate; before weighing it was exposed to a dull red heat to destroy any iodate that might be present; it was rubbed to powder in a mortar mixed with calomel, and the whole then well triturated for ten or fifteen minutes to ensure an intimate mixture. For comparison of the results, the quantity of the materials were alike in the three cases; 60 grains of calomel were used to 41 grains of iodide of potassium. The whole was then put on a tared filter, the resulting iodide washed with distilled water as above, until the filtrate no longer precipitated a solution of nitrate of silver; then well pressed between bibulous paper to remove most of the moisture, and at last dried, either in a temperature of between 70 and 80 degrees, or in a current of dry warm air. During the whole of the operation, light was excluded as much as possible.

The reaction between calomel and iodide of potassium commenced as soon as they were mixed in the mortar, the powder assuming a greenish tinge, which was probably due to atmo-

spheric moisture. 60 grains of calomel must produce 83 grains protiodide of mercury, 41 grains of iodide of potassium ought to decompose $58\frac{1}{2}$ grains of calomel, consequently, by the above proportions, $1\frac{2}{3}$ grains calomel would be left unaltered, and the obtained product ought to weigh but 82 grains. The practical result, however, was, for the above three cases, 49, 56 and 50 grs. respectively. What, then, has become of the difference, which in all cases is about and even more than one third of the calculated result? The obtained powder was of an olive green color, almost without a yellow tinge, one of a very dark almost black hue, while, according to all authorities, the protiodide has a yellowish green color, which on exposure to light darkens to olive green, and at last black (Mohr). It was obvious that the product could not be protiodide, but that a decomposition had taken place, which made it probable that both iodine and mercury might be found in the filtrate.

On a clean copper plate a drop of the solution did not produce a silvery stain, and iodide of potassium no precipitate; protochloride of tin at first produced a white precipitate, changing to a grayish color on further addition; the precipitate formed by gradual addition of sulphuretted hydrogen showed the characteristic changes of color, yellowish, orange, brown and black. Thus the presence of mercury in the filtrate was established.

Sulphate of copper when added to the solution produced a whitish precipitate, leaving the supernatant liquor of a reddish brown color, which disappeared on the further addition of sulphate of copper and a larger quantity of protosulphate of iron; the precipitate was iodide of copper, and proves the presence of iodine, which also manifested itself by giving a scarlet red precipitate with corrosive sublimate.

The same reactions were obtained with the filtrates of the three preparations. Another experiment was then made by taking calomel in considerable excess, to see whether, with a part of it, iodide of potassium would produce protiodide of mercury without subjecting the latter to the decomposing influence of some unaltered iodide of potassium. Accordingly 60 grains of calomel were well mixed with but 35 grains of iodide of potassium, and this powder gradually added to water and triturated with the same. A green powder resulted, and the filtrate showed the

behaviour of those formerly obtained; it also contained iodine and mercury.

Any of the green product, when treated with cold diluted nitric acid, assumed a lighter color, and the filtrate contained mercury; for, on oversaturating it with potassa, a yellowish precipitate was thrown down, and hydrosulphuric acid produced a black precipitate. The powders, therefore, contained metallic mercury in minute division.

The conclusion we have come to, from the above experiments, is, that it is *impossible to obtain pure protiodide of mercury by the reaction of iodide of potassium on calomel*, no matter how it may be manipulated.

In preparing the protiodide of mercury we have, therefore, to fall back on the process directed, I believe, by all Pharmacopœias, of combining the elements by trituration. For this case, however, there is a deficiency in the officinal direction. Mohr asserts that some red iodide is present in the product, even if less iodine be taken than required for the conversion of the mercury into the protiodide, and treating the yellowish green powder with boiling hot alcohol was indispensable. I have found, however, that even with this precaution a pure article is not obtained. When the protiodide, as made by this process, is left in contact for some time with diluted nitric acid, the presence of mercury can be proved in the filtrate by any of the above mentioned tests. To get rid of the metallic mercury with which the preparation is contaminated, it must be treated with dilute nitric acid and afterwards with hot alcohol, to remove any biniodide present; then only is it in the state of purity in which the physician expects it. But how long will it remain in such a state? After weighing out from the bottle several times, if the operation is not performed in the dark, it must contain a detectable quantity of mercury, which probably would not unfit it for internal use, if at the same time another iodide was not formed. The best plan, it seems to me, to keep it unaltered, would be, after careful preparation, to have it put into black vials each containing not over one or two drachms.

NOTE ON MERCURIAL OINTMENT.

By E. H. HANCE.

MR. WM. PROCTER, JR.:—*Dear Sir*,—Having noticed various plans for expeditiously reducing mercury in the manufacture of mercurial ointment, none of which have proved very practical, I offer the following process, which, to my knowledge, has never before been proposed:—

R. Hydrargyri,	.	.	.	.	.	℥iv.
Cetacei,	.	.	.	.	.	℥ss.
Adipis,	.	.	.	.	.	℥ij.
Sevi,	.	.	.	.	.	℥iss

First, slightly warm the mortar, then introduce the mercury, and to this gradually add the spermaceti previously melted, constantly triturating the mixture; the mercury will almost immediately become reduced into very minute globules, and, as the mixture hardens, add a small portion of the lard, and triturate briskly for a few minutes, when the mercury will become entirely extinguished, then gradually add the remainder of the lard and suet.

The above method I have repeatedly tried in small quantities with great success, but in manipulating with large quantities, do not succeed so well.

Thinking the above formula may be of benefit to retail apothecaries, I offer it to you for publication in the “American Journal of Pharmacy.”

Philadelphia, Oct. 22, 1856.

EXAMINATION OF GRAIN WEIGHTS.

By EDWARD R. SQUIBB, M. D., U. S. N., Assist. Director Naval Laboratory.

Some time since, the writer had occasion to examine the different kinds of grain weights that are sold in the market, with a view to determine the most reliable for ship-board dispensing. The appearance of these weights is generally such that no great degree of accuracy would be expected in them; but they are really so inaccurate as scarcely to deserve the name of weights.

From this circumstance, it appears important that dispensers

of medicine should know something of the character of these weights, and hence this notice.

Three kinds are met with in the market; two called German and English, marked in the old way, with a number of ciphers corresponding to the number of grains, and an additional standard mark. These are sold at a very low price. The third variety is much higher in price. These are marked with figures, and found packed in turned wood boxes.

In the examination no notice was taken of variations from the standard of less than one-sixteenth of a grain.

The so called German set consisted of twelve weights from one-quarter to ten grains, wrapped in grey paper. They were all inaccurate except one. Six of them were too heavy by one-eighth to one-quarter of a grain, and five too light by one-sixteenth to one-eighth of a grain. The one grain weight weighed three-quarters of a grain, and the quarter grain weighed nearly three-eighths of a grain.

The English set consisted of seven weights from half a grain to six grains, and were also wrapped in bluish grey paper. These were all inaccurate, but not so far out of the way as the last, except the small weights. The one grain weight weighed $1\frac{1}{4}$ grains, and the half grain weighed nearly five-eighths of a grain.

Neither of these varieties agreed any better among themselves or with each other than with the standard, for in one instance a two and three grain weights weighed nearly one-sixteenth of a grain more than the six grain of the same set, and nearly five and a half of the other set.

The third variety, sometimes called American, but probably German, consisted of thirteen weights, from one-sixteenth to ten grains. These are much better finished; have a figure stamped upon them for the denomination, and are turned up at one corner for more convenient use with forceps. These are put up in small, turned wood boxes. They are much more accurate than either of the others. Three of them were about one-eighth grain light, and one about one-eighth grain too heavy; all four being above the denomination of five grains. The remainder were tolerably accurate.

Persons who buy weights, but who have no standard for comparison, may judge of the reliability and accuracy of any given

set within practical limits, by observing whether they agree among themselves; for it is rare to find weights that are carefully adjusted among themselves that have not had the same degree of care in relation to the standard.

Naval Laboratory, New York, Dec. 10, 1856.

CHEMICAL AND PHARMACEUTICAL MANIPULATIONS; a manual of the Mechanical and Chemico-Mechanical operations of the Laboratory, for the use of Chemists, Druggists, Manufacturers, Teachers and Students. Second and enlarged edition. By CAMPBELL MORFIT, Professor of Analytic and Applied Chemistry in the University of Maryland, and CLARENCE MORFIT, Assistant Melter and Refiner in the United States Assay Office. With 537 illustrations. Philadelphia: Lindsay & Blakiston, 1857. Pp. 626.

In our 21st volume we noticed the first edition of this excellent manual, and are glad to announce the appearance of the second, with 114 additional illustrations, and 14½ additional pages of letter press.

The whole work appears to have been carefully revised, and several new chapters have been added. The chapter on the polarising instruments for analysing saccharine substances, is wisely omitted, being scarcely appropriate in a work on the manipulations of the laboratory. We question the appropriateness of the chapter on barometers, which takes its place. We think the space could have been better filled with details of processes and manipulations.

The importance of such works as this of Professor Morfit, is more and more felt in our profession, and the present edition will no doubt have the wide circulation to which its merits entitle it.

The American pharmacist has not unfrequent calls upon his ability as an analytical chemist, and it should be his aim to cultivate in his apprentices those habits of careful manipulation and patient accuracy which are the foundation of all practical ability in the science of chemistry. A pains-taking youth, with sharp eyes and pliant fingers, cannot fail to become a skilful analyst with frequent practice and the aid of a manual like the one before us. The great requisite for success is PATIENCE—patience in observing—patience in waiting for the full finishing of a process—patience in trying over and over again an unsuccessful experiment or an unsatisfactory analysis. Some of the

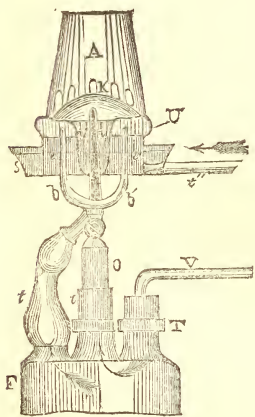
best analytical chemists in the world have been self-taught, and we do not doubt that a young man can accomplish himself in the shops of our best pharmacutists at home, as a competent and skilful analyst.

Our space will not permit us to say more. We subjoin some of the new matter in this edition which appears to us valuable and interesting :—

Devil's Blast Lamp.—This implement, the invention of St. Clair Deville, is designed for producing high temperatures with the use of alcohol, wood spirit, kerosene, camphene, and similar fluids, as fuel. Those hydro-carburets which have the lowest boiling-point and give the densest vapors, afford the greatest heat. The lamp is applicable for fusions, fluxing, and ignitions, and a few seconds only are necessary to raise the heat equal to that of melting iron.

Fig. 161 is a drawing of the apparatus. "It consists of a reservoir F, with

Fig. 161.



three tubulures above, $t\ t'$. By means of the blast of a blow-pipe table, the air is injected into r through the tube v , which is inserted in t . The tubulure t carries the vertical tube o , which has a stop-cock at r , and divides above into two arms $b\ b'$, which pass into a metallic box u , and terminate in its upper part with open extremities cut off obliquely. The box u contains the burning fluid e partly filling it; and it connects with a reservoir by t' , which is kept at a constant level. The centre of this box is a cylindrical tube, closed below, through which passes the blow-pipe c , a continuation of the tube t' , the left tubulure (in the figure) of the flask r . The tube which is at the middle of box u , and envelopes the blow-pipe c , has several small holes $u\ u$ communicating with the empty (or upper) part of

the box u .

"Above the blowpipe, and resting in a furrow in the top of the box u , there is a copper cup k , pierced at the centre with a hole for the passage of the jet of vapor which escapes from the holes $u\ u\ u$, after the bellows are put in action.

"To prevent the burning fluid from becoming too much heated there is a trough s containing water. Before lighting the lamp, the fluid in u is heated till the water in the trough boils; then the bellows are made to act, and the jet of vapor is lighted; after which the heat disengaged by the lamp is sufficient to continue the vaporization of the fluid.

"Above the box u there is a chimney a having a series of holes around near its bottom for drawing in air on the flame of the apparatus."

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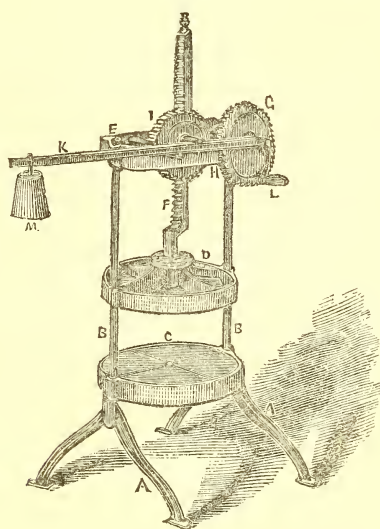
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"A much more convenient implement than the preceding is the lever press, described in Muspratt's Chemistry, and a perspective view of which is shown by Fig. 375. It consists of two wrought-iron pillars *B B*, supported in sockets by the cast-iron feet *A A*. The bed-piece *c* is also secured to the feet by two perforated ears, and has two intersecting grooves sunk into its surface, as channels for conducting off the expressed liquid. The follower *D*, corresponding in size with the bed-piece *c*, is adjusted to the pillars by sliding-ears, and has the rack-bar *F* fixed in the centre. The gearing is sustained by framework *E* attached to *B B*. Motion is effected as follows:—The ratchet-wheel *G* turns upon an axle having its bearings in the top frame. On the same centre is a fixed pinion of eight teeth, only partially

Fig. 375.



seen in the figure, which works in the wheel *I*, of twenty-four cogs; and upon the axis of *I* is another eight-teeth pinion, which acts upon the rack. The lever *K* is forked at the extremity nearest the small winch-handle *L*, and the terminations of of the furcation are received upon the axle *G*. A pin, near *H*, is adapted to a small hole in the frame, by the insertion of which the descent of the lever may be prevented. The matter to be pressed is placed in a shallow, cylindrical box *A*, of tinned copper, Fig. 376, which rests upon the bed *c* of the press. To prevent the contents from being pressed against the sides of the cylinder, and thus abstracting the flow of the liquid thence, it is necessary to use a perforated band with perpendicular ribs on the exterior. Being movable and formed of two parts joined together by

Fig. 376.



a hinge, it can be easily put in proper position around the matters to be pressed (after the latter has been placed in the box), and fastened by means of the pin. The ribs on the outer circumference of this band project against the inner sides of the box, and form intermediate grooves, through which the expressed liquid, issuing from the holes, can readily pass off into the receiving vessel at the spout beneath.

To put the press in action, the lever being upheld by the pin at *n*, the winch-handle is turned to the left, in order to lower the rack and follower, until the latter presses upon the wooden block *b*, Fig. 376, which caps the material under pressure. The lever is then raised, and the pall allowed to work into the ratchet, which will cause the latter to turn, and produce the descent of the rack. This is repeated, if requisite, until a considerable pressure is obtained; and should it be desired to go on, the lever is elevated considerably above the horizontal line, and left to follow the consolidation of the contents of the bag. If, however, this is unnecessary, the pin *n* is inserted, upon which the lever remains. The amount of pressure is also regulated by the disposal of the weight *m* in the various notches of the lever.

When it is not expedient, as in the case of pulpy and similar matters, to press the substance in the box without first enveloping it in a cloth, it may be wrapped in unbleached Russia canvass; and the bag-shape bundles thus formed placed in the box, with a stiff plate of tinned copper interposing every two of them. They should be folded so as not to make a thickness of more than an inch.

As the cloths absorb a considerable quantity of the expressed juice, and occasion loss, the pressing should be accomplished without them in all possible cases. The cloths, used for confining substances from which oily liquid is to be expressed, must be woollen and thick.

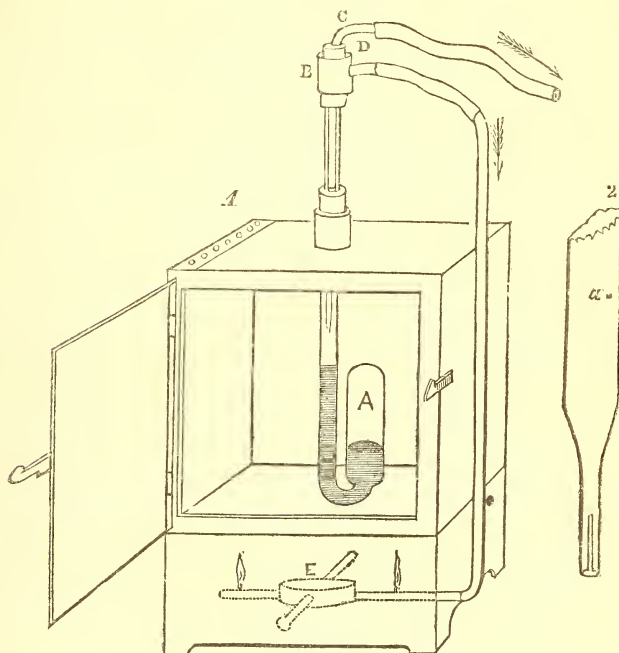
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Kemp's Thermostat.—When street gas is used for heating the air-baths, it is apt to give unequal temperatures, owing to the variable pressure upon the service-pipes at different times. To prevent this annoyance, Kemp has devised a most convenient and efficient apparatus, which he properly designates a *Thermostat*, as it regulates the supply of the gas to the burner, and of course the amount of heat thus applied to the substance under process, thereby insuring a constant temperature for any length of time.

This simple and ingenious apparatus will be found serviceable for all operations requiring a prolonged temperature of great uniformity. The author used it successfully in promoting tedious fermentations, artificial incubation, and for obtaining products of the decomposition of organic bodies at fixed temperatures. The use of mercury renders it available only for temperatures below the boiling-point of that metal; but by making the instrument of iron and substituting fusible alloys for mercury, it becomes applicable for higher degrees.

The instrument itself, shown in the following drawing, consists of an air-thermometer, B A, of glass, and containing mercury in the lower part of the bulb A, and a portion of the stem B. A tube of smaller diameter, as seen in the figure, passes down the axis of the tube B, the annular space being

Fig. 387.



made air-tight by a small brass stuffing-box B, which enables it to be retained at any required elevation. An air-tight connection is made at c with a piece of flexible caoutchouc tube, communicating with the service-pipe by means of a gallows-screw. The gas entering through this channel passes into the long stem of the thermometer, and thence to the burner D.

In using the instrument, the bulb A must be immersed in the water-bath with the substance under examination, if that means of heating is employed: and, in the case of an air-bath or hot press, it must be placed in immediate vicinity of the substance, so as to produce an equilibrium of temperature between the air in the bulb and the surrounding atmosphere.

The inventor thus explains its mode of operation. Supposing, for example, that it is required to keep an object at a temperature of 100° F., then the bulb of the instrument being placed contiguous to the object, a free supply of gas is allowed to flow through the burner, and a flame ignited. The heat soon begins to act upon the air in the bulb, causing it to expand

and force the mercury up the stem B; and when it is found, by the use of a common thermometer, that the heat has risen to the required degree, the inner and smaller tube is to be pushed down until its lower extremity reaches below the surface of the mercury. This would, of course, cause the flame to be extinguished; but, as the preventive of this occurrence, a small hole is bored through the inner tube above the extremity, to permit the transit of a small quantity of gas to the burner. As the passage of the gas is now interrupted, the source of heat is withdrawn, and the cooling influence of the surrounding air then causes the air contained in A to contract, and the mercury in B to sink, and leave the end of the internal tube uncovered. A free channel for the gas is thus opened, so that, as combustion proceeds, the temperature would again rise and cut off the supply; but, in a short time, these two opposing forces reach an equilibrium, and scarcely any variation in the size of the flame occurs. To insure perfect contact of the end of the inner tube with the mercury, the former, to the extent of a half inch, is made of platinum, and amalgamated by dipping it into a liquid amalgam of sodium and mercury.

* * * * *

ELECTRO-METALLURGY.—The deposition of metals by electric action is one of the modern triumphs of practical chemistry. The art dawned in 1805 with the discoveries of Brugnatelli; but no substantial benefits were derived from it until 1838, when Jacobi, of St. Petersburg, and Spencer, of England, applied the principle to the utilitarian purposes of life. The subsequent invention of Daniell, by his well known battery, gave an impulse to the art which resulted in many gratifying and wonderful improvements; so that now it has become, in its greatly advanced condition, a prime element of the economy of many branches of manufacture. Plating, gilding, stereotyping, medal copying, engraving, and kindred arts, are all largely indebted to electro-metallurgy for many of the facilities which at present promote and distinguish their progress.

Those who may wish to experiment in this interesting branch of scientific art will find ample instruction in the following pages.

Any of the many forms of batteries previously described may be used for electrotyping, but the best is Smee's. Care should be taken to observe the directions heretofore given for the treatment and management of batteries; their good condition, proper arrangement and management, being necessary to success.

The intensity and quantity of the galvanic current should be proportional to the work to be done.

Preparation of Articles to be Plated or Copied.—In gilding and silvering, it is merely necessary to have the objects perfectly clean and bright. This is effected by first boiling the articles in a solution of caustic soda or potassa, and afterwards immersing them in dilute nitric acid, and rinsing with water. They are further cleaned by rubbing with a hard brush, and sometimes a little fine sand or tripoli.

Moulds.—Many substances are used for making moulds ; among the best are beeswax, plaster of Paris, fusible metal, and gutta percha.

Wax moulds are prepared by melting the wax over a water-bath, and stirring in one ounce of white lead to each pound of wax. The wax should be clear and free from impurities.

If the object to be copied is a medal, it should be brushed over with sweet oil, and the excess of oil removed with a cloth. A slip of metal or card is bound round the edges of the medal, so as to form a rim. The wax being melted, the medal, to prevent air-bubbles, is held in an inclined position, and the wax, which should not be too hot, poured gently on the lowest part, and allowed gradually to spread over the surface of the medal by bringing it to a level when it is filled to the top of the rim with wax. As soon as the wax begins to set, the band should be removed to prevent cracking. Let the medal and wax remain together until entirely cold, so that they may be easily separated.

If it is desired to take a wax mould from a plaster-cast or medallion, a similar course is followed, the medallion being first prepared as follows : the medallion is warmed a little, brushed over with boiled linseed oil, and allowed to dry perfectly. It then presents a polished appearance and is ready for the wax.

Instead of oil, water is often used ; the plaster being saturated with it by placing the back of the medallion in the water, care being taken not to allow the water to flow over the face of the medallion.

Plaster of Paris moulds are made by mixing the finest calcined plaster with water, to form a thin paste about the consistence of cream. A little of this paste is poured upon the object and well brushed into every part with a camel's hair brush, and then more of the paste is added to produce the requisite thickness. It is allowed to set and dry ; the drying can be facilitated by heating in an oven or otherwise.

The fusible metal of which moulds are frequently made is an alloy of five parts of lead, three of tin, and eight of bismuth, and melts below 212° F.

Care and practice are requisite for producing a good and sharp casting ; and the metal must not be poured too hot. Commence by pouring sufficient of the melted alloy into a suitable vessel,—taking the precaution to skim the *dross* from the surface of it with a card,—and when it is nearly congealed, bring the matrix down upon it quickly and with considerable force, and let it remain until the mass has perfectly cooled. When done with skill, a reverse will be obtained with all the sharpness and perfection of the original.

Gutta percha is probably the substance best adapted for taking moulds for electrotyping. It is applicable to metal, wood, glass, stone, &c. It needs only to be softened by heat either in warm water or by a steam-bath, spread into suitable form, laid and pressed upon the object to be copied, and allowed to cool under the pressure, when the mould will be fit for use.

Sulphur is sometimes used for moulds ; and very beautiful impressions

can be made also with sealing-wax, which takes the minutest lines of the original. Reverses may be procured in lead by forcing the matrix into a bright surface of it, either by pressure or blows.

Non-conducting Substances.—As gutta percha, wax, plaster of Paris, and many of the materials used for making moulds are non-conductors, it is necessary to coat the surface on which it is desired to deposit metal with some conducting substances. The best and easiest of application is plumbago or black lead. A copper band or wire is fastened around the edge of the mould, and the ends formed into a hook, or punched with holes, to make the connection with the battery. A fine brush is dipped into the plumbago and passed thoroughly over the face of the mould, all excess of black lead being carefully removed, and the brushing continued until every part is covered and brightly polished. This treatment will insure a quick and even deposit. In wax moulds it is only necessary to insert, in the edge of the mould, a piece of copper by which to attach it to the battery-pole. In every case, however, the conducting coating must extend to and be in contact with the battery connection. In using metal moulds, those parts on which metal is not to be deposited should be covered with wax or some kind of varnish.

The battery connection is most conveniently and perfectly formed by soldering a copper wire, flattened, at one end to the metal mould.

Bronze powder is sometimes used instead of plumbago and in the same manner. Flowers, and other objects to which plumbago is not applicable, may be rendered conducting by a film of gold or silver. This is applied through the medium of a solution of phosphorus in bi-sulphuret of carbon. The solution is made by dissolving 1 ounce of phosphorus in 15 ounces of bi-sulphuret of carbon, and adding thereto 1 ounce of wax, 1 ounce of asphalte, 1 ounce of spirits of turpentine, and 1 drachm of india-rubber. The india-rubber must be dissolved in turpentine, and the asphalte in the phosphorous solution. The wax is melted first, the turpentine and india-rubber stirred in, and then the asphalte and phosphorous solution added.

This should be done with caution over a water-bath, as the components are highly inflammable. The bi sulphuret of carbon being very volatile, the solution should be kept in a well-stoppered bottle. "The solution, as above prepared, is applied to the surfaces of non-metallic substances by immersion or brushing; the article is then dipped in a dilute solution of nitrate of silver or chloride of gold; in a few minutes the surface is covered with a fine film of metal, sufficient to insure a deposit of any required thickness on the article's being connected with a battery. The solution intended to be used is prepared by dissolving 1 ounce of silver in nitric acid, and afterwards diluting with 3 gallons of water; the gold solution is made by dissolving 2 pennyweights of gold in aqua regia, and then diluting with a gallon of water."

Gold Solution.—Convert a half ounce of gold into terechloride, dissolve the

gold salt in a little water, and add it to a solution of four ounces of cyanide of potassium in two quarts of water and filter.

Silver Solution.—Take of cyanide of silver 1 ounce, cyanide of potassium 10 ounces, water 6 pints; dissolve the cyanide of potassium in the water, add the cyanide of silver, and filter the solution.

Probably a better way to make the solutions of gold and silver in cyanide of potassium is with the battery. Immerse, in a solution of 1 part cyanide of potassium to 16 parts of water, a silver plate, connected with the positive pole of a battery, complete the connection with the negative pole, and keep up the action of the battery until silver is freely deposited on the negative pole. The same process is followed for gold, care being taken to substitute a gold for a silver plate.

Sulphate of Copper is the best salt for the reduction of copper. A nearly saturated solution, acidulated with a few drops of sulphuric acid, is used. One pound of the sulphate in six pounds of water is a good strength.

Cyanide of Copper is sometimes used for depositing copper or iron. It is made by dissolving the oxide in an excess of cyanide potassium, or by making a sheet of copper the positive pole in a solution of cyanide of potassium.

Platinum, zinc, and most of the metals can be reduced from their salts by the battery; but for electrotyping they are seldom or never used.

To have the metals adhere well in gilding and silvering, the articles to be plated must be well cleansed. As silver is generally precipitated on copper, the article is boiled in caustic potash or soda well rinsed with water, dipped in dilute nitric acid, afterwards immersed in a weak solution of nitrate of mercury, and immediately placed in the silvering solution. Gold is usually deposited on silver. The silver object is treated as before with caustic lye, rinsed, and, when dry, is thoroughly scratched with a scratch-brush, which is a bunch of fine wire made into a brush. It is then ready for the battery. In gilding, the solution should be maintained at about 150° F. by a water-bath.

To avoid opposite currents of electricity in the depositing solution from an exhaustion of the solution around the negative pole, and a dense solution forming around the positive pole, the articles should be kept in motion during the deposition; for this motion also prevents that crystalline deposit deemed so objectionable.

To prevent the adhesion of the matrix to the deposited metal, Mr. Mathiot, of the United States Coast Survey, recommends that the engraved copper plates, &c., be coated in a battery with a thin film of silver, and afterwards washed with a dilute solution of iodine in alcohol,—about one grain of the former in a quart of the latter.

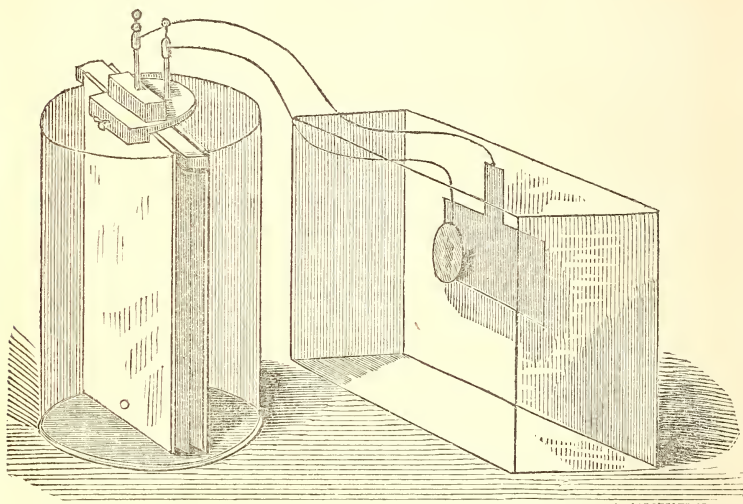
Dusting with black lead, or spreading a little oil over the surface of the article, care being taken not to use an excess, will cause the metals to separate easily. A little wax dissolved in spirits of turpentine also answers well.

Solutions should be kept covered from the air and dust; and the working of the batteries is promoted by having the surrounding atmosphere of a warm temperature.

A few drops of bi-sulphuret of carbon added to a silver solution will produce a bright deposit.

In inserting the articles in the solutions the air adhering to their surfaces, and which prevents a contact of the metals, may be dispelled by moving the articles about in the liquid or by heating the solution.

Fig. 475.



The plates attached to the positive poles should be parallel to the articles on which the metal is to be deposited and present the same amount of surface.

A battery, if in proper working order, will, when the connections are made, show a disengagement of gas at its negative metal; but no gas should be seen to escape at either pole.

Bronzing.—To give the copies of medals and other objects an antique or bronzed appearance like the original, several means are employed. A dark bronze is produced by dipping the object in very dilute nitric acid,—say half an ounce of acid to a pint of water,—and, after drying, heating it gradually and uniformly. The color is deepened in proportion to the heat applied. Sulphuretted hydrogen or hydrosulphuret of ammonia may also be used. Afterwards polish with a brush. Green bronzes are formed by immersing the articles in a solution of chloride of ammonium or chloride of sodium, or by exposing them to the fumes of chloride of lime. The depth of the bronze is regulated by the length of time during which the articles are subjected to the galvanic action. A coating of black lead and subsequent heating of the article, gives a beautiful bronze. A thin film of oil or wax,

and heating until the grease commences to decompose, produces a good bronze. Immersion in a solution of chloride of platinum also gives a handsome bronze.

D. B. S.

ON VALERIANATE OF AMMONIA.

By WILLIAM PROCTER, JR.

Within two months past a demand has arisen for the valerianate of ammonia, owing to the publication in the Medical Examiner of a notice of its successful employment in severe facial neuralgia by certain French physicians. Having been applied to for this substance, and having studied the subject to some extent, the following remarks bearing on the preparation and properties of the salt are offered to those desiring the information.

When valerianic acid, as it occurs in commerce, is neutralized with strong solution of ammonia, and the liquid is carefully evaporated at 150° F., a syrupy liquid results, which is a dense solution of the valerianate of ammonia. If left to stand for some time it shows little, if any, disposition to crystallize, especially if the atmosphere is moist; but under favorable circumstances crystallization occurs, and the solution becomes a mass of crystals.

After several trials, the following method was adopted which proved successful. After concentrating the aqueous solution, it was mixed with twice its bulk of alcohol of 95 per cent., and suffered to evaporate spontaneously. In a few hours, as the alcohol disappeared, crystallization took place without difficulty. As valerianic acid is expensive, and the use of this salt will depend much on its being obtained at a reasonable price, it will be preferable to make the acid and salt in one operation, which can be economically done by the following process, which I have found to yield a nearly pure product.

Take of Bichromate of Potassa, eighteen drachms,
Sulphuric acid, thirteen fluid drachms,
Fusel oil (Alcohol Amylicum), a fluid ounce,
Water, a pint,
Solution of ammonia, a sufficient quantity.

Reduce the bichromate to powder in a mortar, add the acid

mixed with an equal bulk of water and triturate, and then the remainder of the water, so as to get a clear solution. Pour this into a quart flask, add the fusel oil and shake them together at short intervals, until the reaction has abated and the temperature decreased. Then attach the flask to a Liebig's condenser (or use a retort and receiver), apply heat, and distil a pint of liquid from the mixture. The distillate (which consist of a watery solution of valerianic acid, with an oily mixture of valerianic acid and valerianate of oxide of amyl, or apple oil, floating on its surface) should then be put in a flask, and solution of ammonia added with agitation, until in slight excess, and the liquid ceases to redden litmus paper. The apple oil floating on the surface should then be removed, and the solution evaporated on a water bath till syrupy, mixed with alcohol, as before noticed, and set aside to crystallize.

A very neat process is to pass gaseous ammonia through syrupy valerianic acid till super-saturated, and then, after slightly heating the dense solution, to remove the excess of ammonia, crystallizing by aid of alcohol, as above.

Valerianate of ammonia is a colorless salt, crystallizing in very thin micaceous quadrangular plates, soluble in water and alcohol in all proportions. When added to washed ether, a part of the salt seizes on the water and attaches itself to the sides of the vessel, whilst another is retained by the ether. Its taste is at first sharp, and then sweetish, its odor slightly valerianic, like valerianate of soda. When its aqueous solution is boiled, ammonia is perceptible in the vapor. According to Lowig it volatilizes without decomposition, and Gregory gives it the formula $\text{NH}^4, \text{O} + \text{C}^{10} \text{H}^9 \text{O}^3$. Although very soluble, this salt effloresces when exposed to the air. I have not determined its amount of water of crystallization, nor have I been able to find any statement of the dose of the salt, as the paper in the Examiner speaks of a "solution" without noting its strength.

FLUID EXTRACT OF LUPULIN.

BY THE EDITOR.

For the convenience of prescribing, a fluid extract of lupulin has been offered to the physician by some of our pharmacutists, and

the strength has varied from half an ounce to an ounce in each fluid ounce. By the researches of Personne, lupulin contains about one per cent. of valerianic acid, a volatile oil, and a considerable quantity of yellow resin, besides a bitter principle; hence, in treating lupulin to get a concentrated solution, it is necessary to adopt a process that will retain the volatile principles in the preparation when finished. The following process will accomplish this end:

Take of Lupulin, four ounces (Troy),

Alcohol,

Rectified ether, of each a sufficient quantity.

Put the lupulin in a glass displacer, pour upon it four fluid ounces of ether, and then sufficient alcohol to gain six fluid ounces by slow percolation, and set the liquid aside. Then continue the displacement with alcohol till ten fluid ounces of liquid passes. Evaporate this to two fluid ounces and mix it with the ethereal tincture and by means of a heat of 100° Fahr., or spontaneously; let the ether evaporate, so that the resulting fluid extract shall measure four fluid ounces. As a minim equals a grain of lupulin, the physician can easily regulate the dose.

CONTRIBUTIONS TO TOXICOLOGY.

Translated from Wittstein's Vierteljahreschrift by J. M. Maisch.

On the recognition of Phosphorus. By F. VIELGUTH.

When making a chemico-legal investigation on the corpses of two children supposed to have been poisoned by phosphorus, the author mixed a little phosphorous paste with some victuals, and after leaving it in a loosely covered vessel for two months, found the mixture dried to a hard cake, covered with a green mould and possessing a mouldy odor devoid of phosphorous smell, even when freshly broken. But on heating some of it with hydrochloric acid, white vapors of phosphorus acid were evolved, and after trituration and washing another part, several globules of phosphorus could be separated. The balance of the dry mass was again set aside for four months, when muriatic acid still generated white phosphoric vapors, but no globules of phosphorus could be separated by trituration in a mortar; on the pestle, however, were a number of small spots, hardly recognizable by

the naked eye, which could be separated by a sharp knife, and proved to be phosphorus. Thus it was possible, in victuals containing phosphorus, to prove its presence after a lapse of six months.—*Wittstein's Vierteljahresschr.* v. 377.

Chemico-legal analysis of Blood. By DR. G. C. WITTSTEIN.

In the trial of a man charged with the murder of a female, the author had to prove the identity with blood of red stains found on his garments, and on an axe and its handle. The stains were scraped off with a knife, or where that was impossible, were dissolved out by water, and the solution evaporated at a very low temperature.

1. The substance was heated in a glass tube; it became black, and gave off thick white vapors, smelling like burning feathers, and browning curcuma paper, which color disappeared on lying in the air.

2. It was gradually heated to redness with a little sodium, the residue dissolved in water, filtered, mixed with a few drops of a solution of proto- and peroxide of iron, and over-saturated with muriatic acid; which caused a precipitate of Prussian blue.

3. A watery solution was heated to boiling; it separated a brownish grey coagulum, which disappeared on the addition of caustic potassa; the liquid now had a greenish color.

4. A solution was mixed with chlorine water; it was decolorized, and white floccules were separated.

5. On the addition of nitric acid, a greyish, finely flocculent precipitate took place.

6. Tannic acid produced a greyish precipitate with a tinge of violet.

The axe and its handle had evidently been washed; a few spots on the handle could not be dissolved in water, but caustic potassa took them up; at the same time, however, the liquid became of so dark a color that it was unfit for testing it. What little remained on the iron was carefully scraped off; an admixture with iron rust could not be avoided, which remained behind on heating with caustic potassa; chlorine decolorized the alkaline liquor and precipitated white floccules. The scrapings were, however, *insoluble* in pure water, thus proving Rose's experience of the insolubility of the red coloring matter of blood in water, in the presence of oxide of iron, to be correct.

The author also corroborates Rose's statement, that earthy matters render the red coloring matter insoluble in water; but on the green liquor, No. 3, he could not observe the dichroism of which H. Rose speaks; also in an alkaline solution of fresh coagulated ox-blood, he could see but a faint red color in reflected light, although he experimented with concentrated and diluted solutions.—*Wittstein's Viert. J. Schr.* v. 382–389.

On Carbonic Oxide. By ADRIEN CHENOT.

Carbonic acid not being decomposable at ordinary temperature, is incapable of furnishing the necessary oxygen for the support of life; it therefore acts by *obturation*, and destroys life by asphyxia. It is different with carbonic oxide. This gas, in oxidizing to carbonic acid, has a three-fold action: 1, by taking away oxygen; 2, by burning the same; and 3, by the formation of carbonic acid.

These actions are inseparable from each other, and the last produces asphyxia by the cessation of the activity of the lungs; but in the same time oxygen has been condensed, and the vacuum thus established causes compression and bursting. Besides this, 6,000 units of caloric litre oxygen are developed within the body by the oxydation of carbonic oxide, and in this way the organs are cauterized, which explains the extreme agony accompanying a poisoning with carbonic oxide, while on the contrary carbonic acid produces an agreeable intoxication, increasing to a soothing lethargy without any tormenting sensation.

Contrary to many statements in books, the carbonic oxide of ordinary combustion, containing four to six per cent. of nitrogen, is but a mild deoxidizer, and unable to deprive the oxides of the metals belonging to the iron-group of their oxygen. Still it is a somewhat dangerous poison. The *pure* carbonic oxide, however, is not only a strong deoxidizer, but also a violent poison, acting with the rapidity of lightning.

The author then relates a case of poisoning caused by the accidental inhalation of some of the gas, and gives the *external effects* as—1, prostration, as if struck by lightning; 2, eyes distorted; 3, extremities contracted; 4, skin pale; 5, veins swollen and shining black through the skin. The *internal effects* are—1, sensibility very much increased; all ideas, the chief interests,

all prevalent affections are shown to the mind as if it were by an immediate reflection ; 2, intense pains are felt in the chest, as if something was forcibly torn out of it ; the brain is affected by a heavy pressure, which is either a primary effect or else the result of the influence of the pains on the nervous system.

In the open air he was washed with water and vinegar, and given ammonia to inhale ; after 15 minutes feeling commenced slowly to return, accompanied by internal pains, which soon gave way to a sensation of suffocation, together with coldness and considerable perspiration of the whole body, but especially of the head. For several days he was very feeble and suffered from indigestion, but also loathed all victuals ; his sleep was light, but continually and dull, often interrupted by cramps in the knees and toes. These symptoms gradually diminished, but for months afterwards left their marks ; he felt weak, dejected, food was distasteful, and he was afraid of an unexpected noise, which would give him a shock like an electric discharge ; afterwards a kind of numbness set in, particularly in the ends of the fingers, which varied in intensity with the state of the atmosphere.

At another time, by the breaking of a manometer-tube, the author experienced the same symptoms internally ; but he did not fall down, and remained in a half conscious state. Drinking of marshmallow and gum water for several days relieved him internally ; but from the affections noticed above he suffered severely for a long time afterwards. The author cautions all who intend to experiment with this gas.—*Gazette Médicale de Paris*, 1854.

On an Antidote to Phosphorus.

Duflos had proposed in cases of poisoning by phosphorus to administer hypochlorite of magnesia, together with magnesia, and Bechert, who experimented with it, thought it available for that purpose. Dr. Schrader, of Göttingen, however, (*Archiv der Pharm.* lxxx., 165,) found it impossible to save with this remedy any one of the eight rabbits with which he experimented. Hofmann, apothecary in Schlotheim, (*Arch. d. Ph.* lxxxiii, 146,) with two experiments arrived at the same result.—*Wittst. V. J. Schr.* v., 125.

ON THE TREE PRODUCING RED CINCHONA BARK.

BY JOHN ELIOT HOWARD, Esq.

It has long been a desideratum in Quinology to ascertain the botanical origin of this article of the Pharmacopœia which is still so much esteemed, and commands so high a price in the market. I have at length succeeded in obtaining authentic specimens from the place of growth, which will, I trust, tend towards a settlement of the question, although still leaving something to be desired, and to be ascertained by future researches.

Dr. Weddell points out the native locality of this species of Cinchona in his *Voyage dans le Nord de la Bolivie*, published at Paris in 1853. Touching at the Port of Guayaquil, he says :*—

“One of the barks produced by the forests of this region is the *true red bark*, which rivals the best Bolivian bark in the quantity of alkaloids which it contains. The tree which produces this precious bark, and of which I recovered the lost traces in my previous passage by Guayaquil, grows on the western slope of the Assuay, and of Chimborazo, between Chillanes and Guaranda. These geographical data will perhaps assist in deciding the botanical species to which it ought to be ascribed.”

It is exactly from this district, and in the region in which, according to Laubert,† “red bark” was first discovered, that I have obtained a specimen tree which I now describe, and of which I received a few weeks since, contained in two chests, the following portions: viz., two pieces of the trunk, three of the large roots, five of the thickest branches, and one small box containing small boughs and leaves placed between paper. The leaves, though injured by imperfect drying, are still sufficiently characteristic of the species. The collector apologized for not sending the flowers or fruit because the time of year was not favorable. The tree was cut in September, 1855. The account sent was as follows: after enumerating the parts above described, he says:

“All from the same tree of red bark (*cascarilla roja*), cut in 2° 16' south latitude and 16' longitude west of the meridian of Quito, from a

*Page 48.

† “It grows, as we have stated, in the mountains of Riobamba, Cuenca, and Jaen, on very elevated spots, cool at night, and well exposed to the sun, as do all other fine species.”—*Laubert's Memoir*, &c.

mountain called Chahuarpata, near the village of Cibambe, in the province of Alausi, which is one of the spots which produces the best red bark. There are not now large trees to be found, but only a little larger or less than the one sent, which is of middling size. Each piece has attached to it a paper, showing the part of the tree to which it belongs."

The trunk of the tree at the lowest part, from which the roots have been cut away, is not more than between two and three feet in circumference, and the branches are from about fourteen to eighteen inches of similar measure. The roots are of proportionate size. The thickness of the bark on branches of four and a-half inches across is not more than one-tenth of an inch. The weight of the bark is about one-twentieth that of the wood. The very large and fine red bark which we sometimes see, and which commands a price of seven or eight shillings per pound, must therefore be procured from trees of great age and size, and these no doubt fall quickly under the axe of the *cascarillero*, thus accounting for the scarcity of the finest samples. The age of the tree has also probably some influence in producing the light spongy texture of those specimens which have the highest color—the coloring matter amounting in some cases to about one-third the weight of the bark.* The bark varies much in different parts of the tree. That on the trunk, and even on the large roots, presents the familiar aspects of commercial red bark with the peculiar brick-red appearance, where the warty excrescences are rubbed and chafed. Near the roots the bark becomes thicker and more corky.

The small branches present the silvery epidermis which we meet with in the small quills. That on the larger branches resembles exactly stouter quills of red bark, and where the outer coat has exfoliated, the derm shows the small pock marks or indentation, which are characteristic of the best commercial

* It must be an important question for the physician to decide, whether this large percentage of vegetable matter, of complex chemical constitution, produces a good or bad result, when received into the stomach of the patient. I am not aware that we have any reliable information as to the medicinal effect of kinovic and cincho-tannic acids. I find the heart-wood of the tree to be rich in kinovic and less so in cincho-tannic acids, forming together rather more than two per cent. of the weight of the wood. The leaves contain a large quantity of chlorophyll, affording an alcoholic solution of a beautiful dark green color, rich purple by reflected light.



Tree producing Red Cinchona Bark.

quality,* to which indeed the tree evidently belongs; and as I have the pleasure of presenting specimens to the Museum of the Pharmaceutical Society, I need not further describe it in this place, except to say that the different portions of the trunk and branches exhibit the variety of coating usually seen in commercial red bark of genuine quality, thus showing that it all proceeds from one tree.

The varying size and form of the leaves may be inferred from the accompanying woodcut. The largest in my possession, a little imperfect at the apex, measured about nine inches in length by six in width. The shape of the leaves is that of *Cinchona ovata*, approaching perhaps more nearly to the variety α *vulgaris* than to the var. γ *rufinervis*, in which latter the leaf appears to be somewhat longer in proportion to its width. The red bark leaves, however, instead of being "*subcoriaceous*" (as in the α variety, illustrated by specimens given me by Dr. Weddell), are "*submembranaceous*," thus confirming its connexion with the variety γ *erythroderma*, the bark of which agrees very closely with the sort under consideration.

Of this variety, Dr. Weddell says:†

"No *Cinchona* (unless it be *C. condaminea*) is so susceptible of variation through soil and climate as *C. ovata*. It is particularly in the bark that these changes become manifest. * * A single individual of *C. ovata* frequently produces distinct varieties of bark on different sides of the trunk. The periderm is generally (in this species) much thinner on the eastern than on the western side. * * The variations which are to be noticed in the young bark of different individuals are still more striking, particularly in the periderm. * * I at one time thought that the 'true red bark' ought also to be attributed to *Cinchona ovata*, but, in looking at the specimens which M. Guibourt has shown me, I have been obliged to suspend my judgment. The barks on which I have founded this opinion were gathered in the valleys north of Cusco, and as the tree which produces them presents at the same time some differences in the leaves, I have made it into a separate variety, giving it the name *erythroderma*, which recalls its most interesting character."

* See *Pharm. Jour.*, vol. xi., p. 497. The red bark which came in the same ship, and I think from the same place, was of very good quality, and contained from three to four per cent. of alkaloids, including a fair proportion of quinine.

† *Histoire*, &c., page 62.

This seems to have been a most felicitous designation thus conferred by anticipation by this excellent botanist, who has done so much to illustrate the history of this invaluable genus. This variety will in future be, in all probability, regarded as affording the *true red bark of commerce*, of which it is well known there is but one sort which passes current and obtains a high price, whilst other samples (however *red* in appearance), which proceed from *C. micrantha*, var. *rotundifolia*,* or from *C. scrobiculata*,* or *C. pubescens*, or even from a variety of *C. lancifolia*, are not at all received as “red bark,” but are regarded as “spurious,” and the price is low in proportion.

I cannot, therefore, coincide with M. Guibourt in the opinion which Dr. W. appears at one time to have derived from him, that commercial red bark is the produce of a variety of trees. On the other hand, I am glad to agree fully with the opinion of this able professor, as given in his *Histoire Naturelle des Drogues Simples*, that the *Quinquina rouge vrai non verruquex* (viz., that of the branches), and the *quinquina rouge verruquex* (that of the trunk and roots), constitute together the true red bark of commerce.

M. Guibourt adds (and I think his observations are very important, as determining the next question which presents itself to our view):—

“I have shown before how this bark has been, according to false indications of Mutis, attributed to the *Cinchona oblongifolia*. This error was only discovered when Humboldt had brought into Europe the pretended ‘red bark’ of Mutis, or the bark of *Cinchona oblongifolia*. The error was first discovered in Germany by Schrader and De Bergen, who found that the *red bark of Mutis*, or the bark of *C. oblongifolia*, was that which bore in Europe the name of *Quinquina nova*. To the irresistible proofs which these two authors have given I will add—1. That the red bark of Mutis deposited by Humboldt in the Museum of Natural History at Paris, is *nothing else but Quinquina nova*. 2nd. That three samples examined by Vauquelin under the following denominations: No. 2, *Quinquina de Santa Fé*; No. 10, *Cinchona magnifolia*; No. 16, *Quinquina rouge de Santa Fé*; were *Quinquina nova*, shown to be such by the characters of the bark and by the chemical qualities of the macerating liquors. Thus nothing is better proved than this fact, that the *Cinchona oblongifolia* or *magnifolia* produces the *Quinquina nova* and not the *true red bark*.”

* These two sorts illustrated by samples gathered by Dr. Weddell.

It must therefore be fully admitted that *Cinchona oblongifolia* (*Cascarilla magnifolia*, Weddell) is *not* the source of commercial red bark, but only of the worthless *Quina nova*, a bark which has been sold at an extremely low price to the tanners, though I never heard that they profited by the bargain. However frequently this name may be repeated by the old Pharmacopœias, no druggist who regards his character would venture to sell the bark of *Cinchona oblongifolia* of Mutis as having any value in medicine.

It is true that Messrs. Delondre and Bouchardat, in their recently published *Quinologie*, have given forth as their opinion that the "red bark of Mutis" was none other than what is usually considered to be the red variety of the *lanceifolia*-bark of New Grenada. It is not improbable that these might enter into the composition of the immense cuttings of coarse red barks ("cortezones roxos"), which it appears* that Mutis sent over to Spain, since it was doubtless then, as now, too frequently the practice to cut any tree that resembled that which they were seeking,† and to intermingle the products; but this does not disprove the testimony, which appears to me conclusive, that the *Cinchona oblongifolia* of Mutis (furnishing the *Quina nova*, which I have described in a previous volume‡) was that on which this botanist relied upon to compete with the genuine red bark of Quito. He was determined that New Grenada should supply *its red bark*, and since the country did not furnish the article, he fixed upon a sort which externally bore some resemblance, and made a powder of a similar color, and to which it is but just to Mutis to say, that he only ascribes an† "indirectly febrifugal" power.

I think that I have thus sufficiently shown that the old vener-

* See *Pharm. Journal*, vol. xii., page 340.

† "Se substituen en su lugar las cortezas del arbol que se encuentran mas parecido."—*Suplemento de la Quinologia*, page 36.

‡ See *Pharm. Journal*, vol. xii., page 340.

† I extract from the *Suplemento de la Quinologia*, page 109, the following information from the pen of Dr. Mutis, which is stated to be the only *botanical* description of the barks of New Grenada which he published. As the authority of Dr. Mutis has been very prevalent, it is well to give the quotation in its original language and form, that it may lose nothing of its importance by trans-

able name of *Cinchona oblongifolia* may be safely disposed of. In the next place, in order to give some greater certainty in this attempted identification with the new term, I must mention that I wrote to Dr. Weddell, and also transmitted to him some of the leaves. He says (under date August 2nd) in reference to "Quinology:" "You have evidently solved one of its most interesting desiderata," and (under date August 12th, having received the leaves) he adds, "the leaves I find in a better state of preservation than I might have expected from your account. They undoubtedly appear to correspond exactly to what you infer as to their botanical origin."

I have thus given all that it is in my power to afford at present for the direct elucidation of this question. It remains that I add one or two indirect but confirmatory notices. First, as to the *Cinchona colorada de Huaranda* proceeding from a species called by Pavon *Cinchona succirubra*, and which I have described in vol. xi., p. 497 of this Journal as commercial red bark. In the course of last year I found, at Kew, Ruiz and Pavon's a botanical specimen of this, and it proves to be also a *Cinchona ovata*, akin in the sub-membranaceous character of the leaves to those which I have since received direct.

lation: "The following is the statement of the number and properties of the officinal barks inserted by Dr. Mutis in the periodicals of Santa Fé:

EN LA BOTANICA—*Cinchona*.

Lancifolia	Oblongifolia	Cordifolia	Ovalifolia
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Quina.

Hoja de lanza	Hoja oblonga	Hoja de corazon	Hoja oval
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EN EL COMERCIO.

Naranjada primitiva	Roxa sucedanea	Amarilla substituida	Blanca forasters
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EN LA MEDICINA: *Amargo*.

Aromatico	Austero	Paro	Acerbo
Balsamica	Astringente	Acibarada	Xabonosa
Antipyretica	Antiseptica	Cathartica	Rhyptica
Antidoto	Polycresta	Ephractica	Prophylactica
Nervina	Muscular	Humoral	Visceral

Febrifuga

Indirectamente febrifugas."

This enumeration of qualities for the bark of the oblongifolia clearly points to the *Quina nova*, as his recognized red bark.

The bark of the lancifolia is alone admitted to be directly a febrifuge.

That of the ovalifolia can only act through the kinovic acid it contains. Is this inert, or has it any action on the human system?

In reference to this specimen, Dr. Weddell remarks in the *Bulletin de la Society Botanique de France*, tome ii., p. 438:—

“It seems to me now demonstrated that the tree to which I applied in my *Histoire des Quinquinas* the name which I have mentioned, is really that which produces the officinal red bark. My hypothesis is confirmed by an interesting discovery made quite recently by Mr. Howard, in the herbarium of Sir W. Hooker. It is that of a flowering specimen of *Cinchona*, bearing in the handwriting of Pavon the provincial name which is now generally known to be that of ‘red bark,’ *Cascarilla colorada de Huaranda*.

“Mr. Howard having obligingly communicated to me the figure which he had caused to be drawn of this specimen, I had no difficulty in seeing in it the image of my *C. erythroderma*. It is true that the differences* which I mentioned between the bark of my tree and that which is commonly met with in commerce exist still as before, but I have found intermediate forms which so perfectly connect these two types, that there no longer exists in my mind any doubt concerning their identity.

“There may be a doubt, on the contrary, as to the rank which should be attributed to the plant which produces them. Should it still be attached to *Cinchona ovata* as a variety, or should it be raised to the rank of a species? It is a point which can scarcely be finally decided till we know its fruits. Whatever it may be, the discovery made by our colleague Mr. Howard, of a flowering branch of the *Q. de Huaranda*, has certainly made a great step towards the solution of the problem, and has appeared to me worthy the attention of the Society.”

I may add, in reference to the piece of the bark of *C. erythroderma* (*C. ovata* var. γ *erethroderma*) given me by Dr. Weddell, that it agrees in minute particulars with that of commercial red bark. The color of the denuded derm, the indentations upon this, and the impression of the cross crack, forming a ring at distant intervals, also the character of the periderm,—all these correspond; but the color is not fully equal to the *finest* red bark, and it is perhaps rather more dense and woody; but even the bark of the branch and trunk of the same tree vary in these particulars.

The Huaranda bark in the British Museum, which both M. Guibourt and myself regard as genuine “red bark,” has also peculiarities such as might mark a tree grown in less favorable soil. The leaves and small branches of my red bark tree give the impression of luxuriant vegetation. That of Pavon’s speci-

* “The texture of my bark is more woody than that of the typical red bark.”

men, on the contrary, tells of rather stunted growth. But such variations must be expected in a tree growing in localities so distant from one another.

The last particular which appears to me confirmatory of the correctness of this botanical derivation, is the very close analogy which exists between the "red bark" and that which is called in commerce "*Carabaya bark*," and which, according to Dr. Weddell, also proceeds from a variety of *C. ovata*. This struck long ago, and would occur to any person who will take the trouble to compare the two sorts; but it is not a matter susceptible of demonstration, and I will not dwell upon it.

It is to be hoped that the remaining links of this chain of investigation will shortly be added, through our being put into possession of the flowers and fruit, as well as a further supply of the leaves of this interesting tree; and that these will afford materials for completely determining whether it coincides with Dr. Weddell's *Cinchona ovata*, var. γ *erythroderma*; and whether, if such be the case, that plant ought to be raised to the rank of a species.—*London Pharm. Journal*, Oct. 1, 1856.

ON PHASEOMANNITE, A NEW KIND OF SUGAR, CONTIANED
IN THE UNRIPE FRUIT OF THE KIDNEY BEAN (PHASEOLUS
VULGARIS).

By H. VOHL.

The author observed that the juice of the unripe fruit of the kidney bean possessed a very sweet taste, and that after complete fermentation and the distillation of the alcohol formed, the residue had lost none of its sweetness. He attributed this to the presence of mannite.

To prepare mannite from the beans, these were finely cut up, put into a press-bag, exposed for half an hour to hot steam or plunged into boiling water, and then strongly pressed. The brown fluid was mixed with yeast, fermented, and after fermentation neutralized with chalk or carbonate of soda. The fermenting fluid presented the odor of preserved beans.

The fluid produced was evaporated on the water-bath to the consistence of a syrup, and the extract-like mass exhausted with alcohol of specific gravity 0.863. The alcohol was distilled off,

and the residue somewhat reduced in the water-bath, and left for twenty-four hours, when a quantity of flat needles, concentrically grouped, which might be taken for mannite, crystallized from it.

The crystals were freed from the mother-liquor, pressed between bibulous paper, and dissolved in weak alcohol. A small quantity of gum and vegetable gelatine separated, and were got rid of by filtration. When the alcohol had been distilled off, and the aqueous solution decolorized by animal charcoal, it furnished, by spontaneous evaporation, beautiful limpid prisms, partly grouped concentrically, very different in their external appearance from mannite. This body, which possesses a sweet taste, is readily soluble in water and dilute alcohol, but difficult of solution or insoluble in absolute alcohol and ether.

It loses water of crystallization in dry air, becomes dull, and more difficult of solution in water, from which, however, it separates on spontaneous evaporation with its original amount of water. At 212° F. it loses 16.5 per cent. of water.

When heated, the crystals decrepitate and give off water; between 302° and 320° F. they fuse to a colorless liquid, which solidifies in a crystalline form on cooling; when heated to 454° – 472° F., the body begins to boil, with evolution of empyreumatic vapors, which diffuse an odor of burnt sugar. The vapor burns with a luminous flame, without smoking. The carbonaceous residue burns upon platinum without leaving an ash. When mixed with soda-lime and heated, the substance evolves no ammonia.

With a solution of sulphate of copper and potash, it gives a dark azure-blue solution, which does not deposit protoxide of copper either in the cold or by boiling.

The behaviour of this body with sulphate of copper and potash, and its incapability of fermentation, place it in the same series with mannite; but its behaviour in dry air and its composition give sufficient cause to distinguish it strictly therefrom. The author therefore calls it *phaseomannite*.

The combustion of the body, dried at 212° F. with chromate of lead, gave on the average of three analyses—

C 41.0475

H 6.8649

O 52.0876

From this the formula of the body dried at 212° F. is calculated as $C^{21} H^{21} O^{20}$. This formula requires—

C 41.042

H 6.840

O 52.118

Phaseomannite dissolves in cold concentrated sulphuric acid without blackening. The solution only becomes brown when heated to 212° F., deposits carbon, and evolves sulphurous acid. In cold concentrated nitric acid it dissolves without acquisition of color or evolution of gas; on the addition of English sulphuric acid, a body separates in white flakes. In all probability this is the nitro-compound of phaseomannite.

Boiled with dilute sulphuric acid, it appears to undergo no alteration, and afterwards produces no protoxide of copper on the addition of sulphate of copper and potash. When heated with nitric acid, it forms oxalic acid.

Phaseomannite has a pretty strong gurgling action, which explains the production of looseness in the bowels by the use of beans.

The author observed that the beans contained this body in the greatest abundance when the seeds were still small, and that the phaseomannite disappeared as starch was formed.—*Chem. Gaz.* from *Liebig's Annalen*, July, 1856.

NOTE ON THE PRECIPITATION OF VARIOUS SALTS FROM THEIR SOLUTIONS.

By F. MARGUERITTE.

When muriatic acid is mixed with a solution of chloride of sodium, the latter is immediately, if not completely precipitated. But if a current of muriatic acid gas is passed until rejection into a solution of common salt, the latter is precipitated within a few thousandths, and the liquid muriatic acid left in the fluid is in such a state of purity that it may be sold.

With a mixed solution of the chlorides of sodium and potassium, the chloride of sodium is first precipitated, so that by dividing the operation the separation of these two salts may be effected in a certain degree. The insolubility of the chlorides of sodium and potassium in muriatic acid is so great, that under its influence

the sulphates of soda and potash are decomposed into insoluble chlorides, and free sulphuric acid eliminated in the liquid. This decomposition may go very far; thus muriatic acid gas, when passed until rejection into a solution of sulphate of potash, converts nearly 70 per cent. of the latter into chloride of potassium, setting free a corresponding amount of sulphuric acid.

The double sulphate of potash and magnesia undergoes a similar decomposition. Sulphate of magnesia does not participate in this reaction, and, like the chloride of magnesium, it is not precipitated by muriatic acid unless under particular conditions of concentration.

Sulphate of soda, under the same circumstances, is decomposed in a more complete manner, in consequence of the greater insolubility of chloride of sodium in muriatic acid. The precipitation of the chlorides of sodium and potassium in this way appears capable of industrial application—

1. In the preparation of a quality of salt for special purposes;
2. In the production of crude salt; and
3. In the separation of chloride of potassium from the mother-liquors of salt marshes.

The peculiar state of the salt precipitated by muriatic acid, its extreme division, its whiteness and brilliancy, its perfect purity, and the simplicity of its preparation, render it preferable for the purposes of luxury to every kind of salt, whether obtained by trituration or by evaporation with heat. It is obtained perfectly pure by operating upon common salt-water, and still better with a solution of common salt. The acid liquid is decanted, and the precipitate dried upon the sole of a furnace heated in a suitable manner, by which the salt is purified from the muriatic acid with which it is impregnated. Before drying the precipitate, it may be washed with the salt solution, which is afterwards to be submitted to precipitation. This washing removes nearly the whole of the muriatic acid. Lastly, the excess of acid may be saturated with carbonate of soda, the cost of which would not be greater than that of heating the drying furnace, and this would allow it to be spread out, and dried in the open air.

The passage of the gas keeping the liquid in a state of continual agitation causes the precipitation of the salt in extremely fine grains; but it may be obtained in large crystals when the

muriatic acid is allowed to dissolve at the surface of a liquid in repose, as is usually done in the condensation of this acid.

The separation of chloride of potassium from the mother-liquors of salt marshes is more rapid, more complete, and cheaper than the process now employed, which consists in concentrating the mother-liquors by heat, and leaving them to crystallize under conditions of temperature which are not always to be obtained with certainty. Moreover, the product obtained is a triple chloride of sodium, potassium, and magnesium, a compound which must be purified by successive crystallizations, causing a loss of time, fuel, and material. By the action of muriatic acid upon the mother-liquors, nearly the whole of the chlorides of sodium and potassium contained in them is obtained; the chloride of magnesium remains in the solution, which may be employed in the manufacture of chloride of lime. The chlorides of sodium and potassium are separated without difficulty, either by dividing the precipitation, or by their different degrees of solubility when hot and cold.

The advantages of this process in the production of crude salt do not appear to be doubtful. About salt-works there are generally manufactories of sulphate of soda, which are a constant source of muriatic acid. The whole of this acid is not collected in some places, its sale being difficult from the cost of transport. Supposing that all the muriatic acid produced would be sold, 100 kilogrms. of salt converted into sulphate of soda would reproduce rather more than 33 per cent. of their weight in common salt. If it were found more advantageous to apply all the muriatic acid in precipitation, a much larger quantity of salt would be regenerated in this manner. 100 kilogrms. of chloride of sodium, decomposed by sulphuric acid, give 62.39 kilogrms. of muriatic acid, which require 109.1 kilogrms. of water to furnish a solution of the density of the muriatic acid of commerce (1.18). This quantity of water at the ordinary temperature would dissolve, and consequently allow of the precipitation of 38.18 kilogrms. of salt.

The solution of muriatic acid, if it be not sold, will give when gently heated 43.2 kilogrms. of gas, which precipitate 26.45 kilogrms. more salt; and the solution, when deprived of all the gas which it is capable of giving off, will represent acid with 16

equivs. of water, which is still serviceable for some purposes. In these two operations the quantity of salt precipitated will be 64.65 kilogrms. This is theoretical; but if we consider the quantity of salt reproduced as 50 per cent. only, this valuation will not appear exaggerated when we consider the efficacy of the means and the simplicity of the operation.

The principle of this operation consists in the employment of a volatile agent, which, after serving to precipitate the salt, may be driven off by heat, without leaving any impurity behind it. Upon the same principle several other salts may be eliminated from their solutions, although in a less complete manner. Carbonate of soda may be precipitated in a state of great purity by ammonia from a solution of common soda; the crystalline salt obtained, when dried upon a stove, does not retain the smallest trace of ammonia. Moreover, the same quantity of ammonia will serve almost for an indefinite period, as it is sufficient to heat the ammoniacal liquid to recover all the gas which it had dissolved. Ferrocyanide of potassium, and some other salts, are also precipitated by ammonia.—*Chemical Gazette*, Sept., 1856, from *Comptes Rendus*, July, 1856.

ON SOME NEW PROPERTIES OF FRESHLY CALCINED WOOD CHARCOAL.

By M. MORIDE.

The deoxidising power of wood charcoal is well known, when used in the dry state and under the influence of an elevated temperature; but I do not know that any one has mentioned it as reducing metals in the midst of neutral, alkaline, or acid liquors, neither am I aware that any one has observed that in contact with a dilute and alcoholised acid, freshly calcined wood charcoal caused the formation of ether. I am continuing this study, but I have determined to make known the results of my first experiments.

Coke, charcoal from lignites, animal and bone charcoal, do not produce the effects of which I am about to speak.

1st. When incandescent wood charcoal is plunged directly, or after being extinguished with cold water, into an acid solution of sulphate of copper, the metal is gradually deposited upon the

charcoal until it may be entirely recovered. In neutral or alkaline liquors the reaction is not so well performed. In Barreswill's liquor, for instance, the copper deposited upon the charcoal has a very beautiful iridescent appearance. When nitric acid, hydrochloric acid, or sulphuric acid is used to acidify the solutions, the effect is the same, only that it is clearest with sulphuric acid.

2nd. I have observed that the metallic salts of organic acids are less easily decomposed than those which contain mineral acids.

3rd. The solutions of silver in nitric acid, whether neutral or acid, and chloride of silver dissolved in ammonia, are easily decomposed by freshly calcined wood charcoal. The silver is soon seen to cover the charcoal in the most beautiful manner; it sometimes appears crystallized.

4th. Copper may, by this same means, be precipitated from ammoniacal solutions; but if these solutions likewise contain silver, the latter will be first reduced.

5th. Finally, incandescent wood charcoal plunged in Fowler's solution, acidified with sulphuric acid, produces a very agreeable ether which I intend to examine. It will be easy to make in this way, by varying the acids, nitric, acetic, sulphuric ethers, &c.

6th. Zinc, iron, platinum, lead, and mercury may be precipitated by wood charcoal, but they re-dissolve in acid liquors; this does not occur at all with silver, and with copper not until twenty-four hours after the operation.—*Chemist, from Comptes Rendus*, Oct., 1856.

CARYOPHYLLIC ACID.

By L. CHIOZZA.

Calvi has repeatedly analysed the caryophyllic acid procured from oil of cloves, in order to test the admissibility of the formula established for it by Gerhardt. The previous analyses made by Dumas, Ettling, and Bäckmann gave more carbon than is required according to the formula proposed by Gerhart. The

numbers obtained by Calvi in his analyses differ very little from those required by this formula. The acid employed for analysis was purified by dissolving the crude acid in caustic potash, and boiling the solution until the complete removal of the hydrocarbon which accompanies caryophyllic acid in oil of cloves. The analyses gave—

	Found.					Calculated $C^{20}H^{12}O^4$.
	I.	II.	III.	IV.	V.	
C	72.7	72.4	72.7	72.7	72.6	73.1
H	7.0	7.0	7.0	7.3	7.3	7.4

The equivalent weight of caryophyllic acid cannot be deduced from the density of its vapor, because this acid is altered at a high temperature. Calvi, in several experiments, obtained the same result as Dumas, who gives the density of the vapor of this acid = 6.4. The density of vapor calculated from the formula would be 5.66.

The analysis of the baryta-salt gave an amount of baryta which would correspond with the formula $C^{20}H^{12}O^4$; but the analyses of other salts gave variable and contradictory results, as there is great difficulty in preparing these salts in a truly neutral state. Thus the potash-salt always loses a certain quantity of acid during evaporation.

The other experiments made by Calvi confirm the results already obtained by other chemists. The only interesting fact which he ascertained in the investigation of the decomposition of caryophyllic acid is its conversion into a neutral oil by distillation over anhydrous baryta. The product thus obtained is no longer attacked by solution of potash, and has quite different properties from caryophyllic acid, although (if we may conclude from the results of one analysis) it has the same composition and the same density of vapor.—*Chem. Gaz.*, Nov. 1, from *Liebig's Annalen*.

ON EFFERVESCENT POWDERS.

By JNO. M. MAISCH, of Philadelphia.

Effervescing powders are used on account of the carbonic acid in gaseous state which is generated as soon as they are thrown into water to dissolve. The carbonic acid is highly esteemed for its agreeable refrigerance, or it is employed to mask to a certain extent the taste of other medicines. The generation of carbonic acid is effected by the mutual decomposition of a carbonate with a vegetable acid or an acid salt. Of the carbonates used, the preference is usually given to the bicarbonate of potassa or soda, seldom only the officinal carbonate of magnesia or monocarbonate of soda are employed; carbonate of potassa is entirely unfit to enter into such a combination, owing to its deliquescence.

Among the acids, recourse is had to the tartaric and citric, they being the only two officinal acids suitable for such a preparation; sometimes they are replaced by bitartrate of potassa, the object of which is to have the evolution of carbonic acid going on in the stomach.

In the United States and England, the carbonate and the acid are usually kept in two separate papers, distinguished by their blue and white color, while on the continent of Europe, for its greater convenience, a mixture of the two is habitually employed and is even officinal in most of the continental Pharmacopœias.

The U. S. Pharmacopœia has no officinal formula for any of these powders; however it is customary for the apothecary to prepare two different kinds, one under the name of "*soda powders*" which shall contain for one dose 30 grains of bicarbonate of soda in a blue paper, and 25 grains of tartaric acid in a white one. The "*Seidlitz powders*," intended for a slight laxative, require 2 drachms of tartrate of soda and potassa with 10 grains of bicarbonate of soda in a blue, and 30 grains of tartaric acid in a white paper. These powders became officinal in the Prussian Pharmacopœia under the name of English effervescing powders, (*Pulvis aërophorus Anglicus*) and are put up in the greatest part of Europe in accordance with this formula. It has been proposed by Dr. Mohr to substitute tartrate of soda for Rochelle salt,

from which tartaric acid precipitates cream of tartar. Sometimes, especially in France, where such formula have originated and were published, the Rochelle salt is partly or wholly replaced by sulphate of soda, and sulphate of magnesia, and the powders thus prepared indiscriminately sold under the name of "poudre de Sedlitz," from which they chiefly differ by their bitter taste, the aperient properties being about alike. If these powders are put up in an air-dry state, they keep admirably well for any length of time. Of the British Pharmacopœias, the Edinburgh and Dublin give directions for similar preparations under the name of *pulveres effervescentes*, for which either bicarbonate of soda or potassa may be used. The Dublin Pharmacopœia also directs *pulveres effervescentes citrati*, which are made of citric, instead of tartaric acid. Under the name of simple effervescing or Seltzer powder, Dorvault directs 4 grammes (61.7 grs.) of bicarbonate of soda in a blue, and the same quantity of tartaric acid in a white paper, which, when dissolved in a wine bottle full of water containing $1\frac{1}{2}$ or 2 oz. of syrup of currants or lemon, form a very refreshing drink. There are many similar formulæ for "effervescing lemonade," usually consisting of bicarbonate of soda, which for its cheapness is preferred to the potassa salt, mixed, with a certain quantity of sugar, flavored with oil of lemon in one paper, and of tartaric or citric acid done up in another one. The chief object in making such powders is to obtain their refrigerant qualities, and the acid is therefore taken somewhat in excess to assure of the entire decomposition of the carbonate and to procure a quantity of an acid salt, either bitartrate or bicitrate, which by its agreeable acidulous taste adds much to the pleasant and refreshing properties. Sometimes, however, the physician desires an antacid effect at the same time with the refrigerant action of the carbonic acid, and increases the quantity of the alkaline carbonate sometimes far beyond the power of saturation of the acid employed.

An effervescing powder is also occasionally made, consisting of bicarbonate of ammonia, and of citric acid, and thus forms a pleasant substitute for the solution of citrate of ammonia of the London College, in as much as with each dose beside the ammonia, a corresponding quantity of carbonic acid is administered

20 grains of the crystallized citric acid will saturate 18 grains of the bicarbonate of ammonia, the quantity of which, however, may be enlarged if a more decided action of the ammonia is wanted.

Sometimes, though as yet not very often, if Seidlitz powders are excepted, effervescing powders are used to cover the unpleasant taste of some medicines; in this view they are mostly used in connection with Rochelle, Epsom, and Glauber's salt, the bitterness of which salts is to a certain degree masked, particularly if taken in connection with lemon syrup. Meirieu has proposed to administer sulphate of quinine in this manner, by mixing 1 decigramme of it (1.5 grains) with 1 gramme of tartaric acid, and in another paper 1.2 grammes of bicarbonate of soda and 8 grammes sugar; the quantity of the acid just suffices to convert the soda into the neutral tartrate, and to render the quinine easily soluble, which is intended to be taken with its bitterness masked by the sugar and the evolved carbonic acid. A ferruginous effervescing powder has been proposed by Colombat, and the formula for it published by Dorvault. The powders are made by mixing 2 grms. (grs. 30.87) sulphate of iron, 6 grms. (grs. 92.60) tartaric acid, and 12 grms. (3 drachms) sugar, and dividing the mixture into 12 powders, which are done up in white paper; each of the blue papers contains 5 grs. of bicarbonate of soda and 15 grs. of sugar. A reaction at first takes place between the iron and soda salt, resulting in some sulphate of soda and bicarbonate of the protoxide of iron, which is decomposed together with the rest of the bicarbonate of soda by the tartaric acid; the acid is just within the fraction of not quite 2 grains for the 12 powders, sufficient to produce tartrate of the protoxide of iron and bitartrate of soda. If the assertion of many practitioners be correct, that iron exhibits the most useful and reliable action in the animal body when administered in the state of protoxide, the above prescription might perhaps be found very beneficial and claim the attention of physicians. Tartrate of protoxide of iron is but little soluble in water, and it might perhaps be thought objectionable on that account; it remains to be seen, however, whether bitartrate of soda or the carbonic acid does not act as a solvent, or whether the digestive liquids do not easily decompose it, so as to assimilate the iron.

If the pure sulphate of the protoxide is mixed with tartaric acid, the mixture keeps admirably well, so far at least as may be judged from the color, and in making such an effervescing draught, the iron will consequently reach the stomach before it can be oxidized to sesquioxide by the influence of the atmosphere.

In the preceding I have taken a cursory view of the various kinds of those effervescing powders, which are put up with the acid and the carbonate in different parcels, and will now proceed to the principal object of this paper, that of drawing attention to that very convenient form of the same kind of powders, which differ from the former in containing all the materials necessary for the evolution of carbonic acid gas mixed into one uniform powder. Of these effervescing powders, Wood and Bache's Dispensatory has on page 54 the following short notice : "Tartaric acid, dried by a gentle heat and then mixed in due proportion with bicarbonate of soda, forms a good effervescing powder, a teaspoonful of which, stirred into a tumbler of water forms the dose. The mixture must be kept in well stopped vials." Every body who has been making such powders, will have experienced that such a mixture, no matter how closely stopped it may be kept, will spoil and even become moist. Professor Otto has made some experiments and discovered some interesting facts with regard to this phenomenon, an account of which he has published in the *Annalen der Chemie und Pharmacie*, xvii, 378, of which I will give a short abstract. A mixture of equal parts of bicarbonate of soda and tartaric acid becomes moist when introduced into well stopped vials, and this change takes place the quicker, the better the air is excluded ; it keeps better if the vials are simply covered with paper ; but if the powder is kept in ordinary paper boxes, he has never seen it to spoil. Experiments of Bosse have shown that such a mixture loses weight from the expulsion of carbonic acid, which loss is greater, the better the powder is secured from contact with the air. This decomposition is introduced by a portion of moisture which the mixture contains, and which must evaporate on the air, to keep the powder unaltered. But if both ingredients are dried before mixing at a temperature between 120 and 145° F.

the tartaric acid loses nothing, but the bicarbonate of soda $1\frac{1}{2}$ per cent.; if the mixture is now made and introduced into a well stopped vial, it has commenced to decompose after the lapse of 24 hours and the decomposition progresses rapidly. But if the soda salt was dried at 167° F. (60° R.) the mixture was unaltered after having been kept 12 days in a closed vial. It is the water of combination, and not hygroscopic water that introduces the change, though damp favors it; this water is set free at the formation of tartrate of soda, and causes the moisture and liquefaction; it must be allowed to evaporate; that takes place easily from the fine powder at the tension of a low temperature, and for this reason the alteration is so little that it is without any consequence. Such a mixture which has been in contact with the air for some time and is still unaltered, commences to change as soon as it is introduced into a stopped vial. If the powder is directed to be kept in a vial, it might be more advisable not to dry the ingredients, but the finely powdered mixture. In no case, however, not even with the greatest care could the powder be kept for many years.

These remarks apply next to the effervescing powder of the Prussian Pharmacopœia, with which the experiments were made; it is prepared of 4 parts of bicarbonate of soda, 3 parts of tartaric acid, and 7 parts of white sugar. Immediately on throwing this powder into water, effervescence takes place violently. Other preparations, however, generate the carbonic acid slowly, even so slow, that the greater part of the reaction takes place in the stomach. By this means quite a quantity of carbonic acid can be introduced into the stomach at a single dose, and is there mostly generated by degrees. Vogler gives the following formula: Exsiccated carbonate of soda $\mathfrak{z}\text{ij}$, bicarbonate of potassa $\mathfrak{z}\text{ij}$, sugar $\mathfrak{z}\text{ss}$. If three drachms of bicarbonate of soda are substituted in this formula for the exsiccated soda, a larger amount of carbonic acid will be evolved. But as bitartrate of soda is a heavy salt and only slightly soluble in cold water, the idea suggests itself of looking for a comparatively more soluble salt, to take the place of the former in such a combination. Such a salt we find in the bitartrate of soda, which is much easier soluble in water than cream of tartar, but does not act so violently on the carbonate as the free acid, especially not if cold

water is used for the menstruum. Bicarbonate and bitartrate of soda must be used in the proportion of 9.20 to furnish a neutral salt. If the ingredients are pulverized separately and afterwards mixed with finely powdered sugar, the mixture will keep very well in a paper box, with no other precaution except to keep it away from dampness.

In a similar manner effervescing powders may be prepared with bicarbonate of ammonia, of which 14 parts are necessary to completely saturate 15 parts of tartaric acid, so as to form the neutral tartrate of ammonia, or 30 parts of the acid are required if the formation of bitartrate of ammonia is desired. 7 parts of bicarbonate of ammonia will saturate $18\frac{1}{2}$ parts of bitartrate of potassa, and 3 parts of the carbonate, $8\frac{1}{4}$ parts of bitartrate of soda, in the first case forming the tartrate of ammonia and potassa, in the latter tartrate of ammonia and soda. The same results may be arrived at, if bitartrate of ammonia be used, and it may suffice simply to state here the required proportions :

16 parts of it saturate 7 parts of bicarbonate of ammonia, forming neutral tartrate of ammonia.

2 parts of it saturate 1 part of bicarbonate of soda, forming tartrate of soda and ammonia.

4 parts of it saturate $2\frac{1}{2}$ parts of bicarbonate of potassa, forming tartrate of potassa and ammonia.

3 parts of it saturate 1 part of dry carbonate of soda, forming tartrate of soda and ammonia.

An effervescing powder containing magnesia was formerly more extensively used in Europe than at present; it consisted of carbonate of magnesia zij , tartaric acid zss , sugar zi , oil of lemon gtt. iij . An effective and very pleasant cathartic may be prepared from the following ingredients : carbonate of magnesia, citric acid, sugar, *aa* zij to ziiij , oil of lemon gtt. ij . The ingredients are to be separately rubbed into a fine powder and then mixed. Thus extemporaneously prepared and soon taken, it makes a pleasant drink and is a good cathartic. The powder is to be stirred into about half a pint of water, when chemical reaction will instantly commence; when it has fairly set in, it should be taken at once. I have omitted to make experiments with regard to its keeping. It remains to be seen, and experiments ought to be made, whether it may be preserved unaltered

for some time according to the plan suggested by Professor Otto. As citric acid contains much water of crystallization (4 equiv.) it might probably in this case be advisable to first expel the same by exposure to heat, and after it has become quite cool to mix it with the other ingredients previously finely powdered. It might be of great service upon voyages in cases where saving of space is of some account, and where bottles cannot be well packed; it would combine smallness of bulk and portability, and for these reasons would be preferable to the official solution. Its great advantage over the soluble citrate of magnesia would be its cheapness and its far more refreshing taste, produced by the carbonic acid set free and the citric acid still in solution. The citric acid in the formula given may be augmented, but as the reaction does not take place at once, and as it is drank before the saturation is completed, there is no reason for doing so; the solution will still hold a sufficiency of free citric acid to cover the taste of the magnesia salt, and render the draught quite a refreshing one; the chemical reaction is completed in the stomach.

If the administration of an iron salt is intended, Colombat's formula given above may be used, and all the ingredients mixed into one powder; but it must be carried in mind that this results in a *tartrate* of the protoxide of iron. As it has always been a desideratum how to administer a carbonate of the protoxide of iron in an unaltered state, and as even Vallet's mass becomes oxidized, the following mode of administration is suggested. Sulphate of iron ʒiiss, tartaric acid ʒijss, dry carbonate of soda ʒijss, sugar ʒijj. The chalybeate waters contain usually the carbonate of protoxide of iron, dissolved by an excess of carbonic acid, besides some alkaline salts. Physicians value these waters, because they are usually better adapted to the digestive organs and are easier assimilated, consequently of a quicker and more reliable action on the human frame than the ordinary ferruginous preparations. These properties are doubtless due to the presence of that mild acid, the carbonic and probably to the aperient salts, both of which combine their action with that of the iron. In the formula given above sufficient carbonic acid is generated to convert the iron salt into a carbonate of the protoxide, and keep the same in solution. Thrown into

a bottle filled with water, a clear solution is obtained, from which on exposure to the air sesquioxide of iron is separated. If a brisker effervescence is desired, the acid and soda may be increased in due proportion, or instead of the latter, $5\frac{1}{2}$ scruples of bicarbonate of soda substituted, when the mixture will contain double the amount of carbonic acid. A little sulphate of soda, corresponding with the quantity of iron will be formed, and the neutral tartrate of soda which does not decompose the dissolved carbonate of protoxide of iron. The quantity of these salts formed is but small, only large enough as is necessary for obtaining a sufficiency of carbonic acid; thus an opportunity is offered to combine with the powder such substances as may be thought necessary to increase its effect or direct it to a certain point; such substances of course must not interfere with the carbonate of iron. The teaspoonful of the above chalybeate effervescing powder contains about 18 grs. of sulphate, equal to $7\frac{1}{2}$ grs. of carbonate of protoxide of iron. With regard to the sulphate of iron I would here yet remark, that even not the finest crystals ought to be used for such a preparation if stability is desired. Without entering into details at present it may suffice to say, that this salt keeps best, by itself and mixed with other powders, if it has been precipitated from a concentrated solution by strong alcohol, well washed with the same, and afterwards well dried in the open air, spread out in thin layers on bibulous paper.

My investigation with reference to the administration of quinine has not been completed yet, but the few experiments made convince me that it is a very good mode to administer quinine and cinchonine in an effervescing powder, made with citric acid and sweetened with sugar, previously rubbed up with the yellow skin of fresh orange peel. This corrects the taste better than lemon, cloves, or any other aromatic that I have tried. The bitterness seems to be less perceptible, when the effervescing powder affords a nearly neutral mixture, and a sufficiency of the orange skin has been added to impart a high and agreeable flavor to the draught.

Administration of Ammonia.—Bicarbonate of ammonia is devoid of the ammoniacal smell, and, although, having still a somewhat pungent taste, may be given in almost any form, even the

powder and solution hardly requiring more than a little sweetening to render it pleasant to take. If the full effects of ammonia are quickly desired, we have no other preparation for such a purpose, but the various preparations of caustic ammonia and the officinal sesquicarbonate. This latter one only can be made into pills, but is usually given in solution, like spiritus and aqua ammoniæ; their taste and smell, however, are so very pungent and penetrating that they cannot be covered or masked, either by aromatics or mucilages. As they are valuable remedies in scarlet fever, the small children, for whom they are prescribed, often object to taking them. We have, I believe, a much more convenient and pleasant form to secure the effects of ammonia without incurring its penetrativeness; we may arrive at this end in a somewhat similar way as above, in trying to obtain the properties of carbonate of protoxide of iron. If a solution of the neutral tartrate of ammonia is mixed with a solution of carbonate of potassa, an ammoniacal smell will soon be perceived, and a glass rod, moistened with muriatic acid, will evolve thick white vapors if held above the surface of the liquid. An interchange has taken place, a double decomposition, by which tartrate of potassa and carbonate of ammonia, has been formed.

If bitartrate of ammonia is mixed with a solution of carbonate of potassa, an effervescence will take place, and the formation of a double tartrate of the two bases; a further addition of carbonate of potassa will displace the ammonia from its combination, which, with the carbonic acid of the potassa salt and that still held back by the solution, combines to bicarbonate or sesquicarbonate of ammonia. But if, after the saturation of the bitartrate of ammonia with carbonate of potassa, the carbonic acid is expelled by a moderate heat, or if the double tartrate of potassa and ammonia be taken at once, the subsequent addition of carbonate of potassa causes the formation of monocarbonate of ammonia. Bicarbonate of potassa used in place of the carbonate, will, in all cases, cause the same result, that is, the production of bicarbonate of ammonia. Consequently, if we want the formation of monocarbonate of ammonia, we have to bring in contact neutral tartrate of ammonia, or its double salt with tartrate of potassa, and carbonate of potassa; as this latter, however, cannot be dispensed in form of powder, and as it dissolves in water

too easily, and for this reason acts too quickly on the tartrate so as to form carbonate of ammonia, it is not fit to answer the purpose of having the reaction going on in the stomach so that the powder may pass the organs of smell and taste without exhibiting anything but a salinous taste ; the dry carbonate of soda then takes its place, on account of its similar action and its slower solubility ; even carbonate of lime might be used in some cases ; the powder should be mixed in syrup and given at once, but care should be taken not to direct an excess of carbonate of soda, which might develop its caustic properties in the stomach. Tartrate of ammonia, with which I have experimented a short time ago, I believe to be a far more stable salt than is usually supposed, but other salts such as the sulphate and muriate can be used in lieu thereof ; it should, however, never be left out of sight that with these powders a double decomposition takes place, and that, for instance, a mixture of carbonate of lime and sal ammoniæ would be inadmissible, on account of the formation of chloride of calcium. One part of exsiccated carbonate of soda would suffice for one and three-quarter parts of the neutral tartrate, one and a quarter of sulphate and one part of muriate of ammonia.

Whenever medicine is administered, it ought not only to be prepared nicely, but appearance and taste ought to be made as agreeable as possible, so as to please the eye, and, if possible, the palate of the invalid. Very often has the pharmacist occasion to take notice of some behavior of medicines in this regard, often he may be interested sufficiently to make some experiments for the sake of information, and thus arrive at some satisfactory results. We know sugar has been tried to mask the taste of disagreeable medicines, aromatics and spirits have been tried, but for some in vain. The effervescing powder seemed to be one means that had not been sufficiently tried yet, and a desire to find a more pleasant way for administering ammonia, has also lead to the experiments with iron to discover a way to administer it in the state in which it occurs in most of the chalybeate springs. These are the reasons for having undertaken these investigations ; if the result and the suggestions expressed will inspire others to a trial of pushing forward in this direction, the results might probably be very satisfactory.

From the Proceedings of the American Pharmaceutical Association.

REMARKS UPON THE MEDICINAL PLANTS OF CHEROKEE GEORGIA.

By ROBERT BATTEY, of Rome, Georgia.

While this section of Georgia was occupied by the Cherokee tribe of Indians, the collection and exportation of medicinal plants and roots, together with slugs of silver, (obtained from a source now unknown) skins and venison hams was their only means of securing the requisite supplies of salt, whiskey, gunpowder, calico, &c., consumed by them. One George Lavender, a white man, (who early attached himself to the Cherokees, and afterwards married, I believe, the daughter of John Ridge, one of their chiefs,) was the principal trader of the tribe. Establishing himself at the point now known as Rome, he carried on a considerable trade in the articles named, and is said to have had engaged in his service numbers of wagons, transporting these commodities to Augusta, a distance of two hundred and fifty miles, and returning with goods for his store. In this way he accumulated in some twenty years quite a large fortune. He sent to market chiefly pink root, serpentaria, senega and ginseng. I can obtain no definite data as to the annual amount thus sent off, or the relative quantities of each. Spigelia and serpentaria doubtless predominated largely. I am informed that he was in the habit of shipping spigelia with the top attached, for which he exchanged salt, powder and dry goods, allowing the Indians two cents the pound. During one season, having the monopoly of salt, he is said to have exchanged an entire sack in small lots, for slugs of native silver, weight for weight. Many marvellous tales are told of him and his traffic.

For some years prior to the removal of the Cherokees west, the supply of these plants greatly diminished, until the trade in them almost entirely ceased, and the Indians devoted themselves more to the culture of grain, which became so abundant as to be almost worthless as an article of sale. During the space which elapsed since their departure, the stock of medicinal plants has gradually accumulated in our forests, until a profitable business could again be done in them, had we the Indians among us as laborers. Our negroes cannot be depended upon for discretion and industry, while white laborers regard it as entirely too

small business to engage their attention. It is scarcely probable that a business will ever again be done here in them, until the prices shall so far advance as to cause the avarice of our population to overcome their pride.

The fertility of our mountain lands, which chiefly distinguishes this section of Georgia, peculiarly fits it for the spontaneous growth and cultivation of medicinal plants. Our climate intermediate between that of Pennsylvania and Florida, gives us many of the native plants of each, and enables us to cultivate successfully a larger variety.

Capsicum annuum grows well here, but not to the perfection of the middle and lower portions of our State.

Cassia Marilandica is found in considerable abundance, employed to some extent in domestic practice; not used by our physicians.

Chenopodium anthelminticum grows very abundantly in fence corners; old fields are often nearly covered with it; seldom found in the forest; employed in infusion as an anthelmintic under the name of Jerusalem tea. But for the expense of apparatus a good business might be done in the distillation of the oil.

Chimaphila umbellata abounds in our forests, but not to the extent it does in portions of middle Georgia. It possesses a sandier soil than ours; much use is made of it "to cleanse the blood." It is sometimes called prince's pine.

Cimicifuga racemosa is very abundant along the Chattahoochie River, as also throughout the State; used by the profession in private practice and freely by the "steamers"; known among the farmers as "rattle weed."

Frasera Walteri is very abundant, and frequently offered to druggists under the name Columbia root; used as a substitute for colomba by the profession as well as in domestic practice.

Cornus Florida is a very common tree in our forests, of usually a small size, and is very attractive to the eye when in bloom. Dogwood bark is universally used as a tonic after fevers and intermittents.

Anthemis cotula is one of our greatest pests. May-weed, stink-weed, dog-fennel, and wild chamomile are its vulgar names. It completely covers waste lands and the commons around our cities and towns. The bruised herb is said to blister as promptly

as cantharides. It is little if at all used here. The infusion gives rise to abortion in females. During the hot summer months it exhales a very offensive odor.

Eupatorium perfoliatum is very abundant, and much used in domestic and steam practice.

Ficus. The fig grows well with us in some of its more hardy varieties. Our cold winters occasionally cut them down. We grow a fig which, although cut by the frost nearly every winter, is still of so vigorous a habit as to spring up again and bear two crops of very excellent fruit during the season. There are many varieties cultivated in our State. During the past spring, the writer was presented with a box of most delicious figs grown and cured in the lower section of the State. More attention should be devoted to them as an article of commerce. No attempt is made to preserve them here, save in syrup and as pickles for the table, in which forms they are much esteemed.

Gentiana an article is brought to us from the country, which is not distinguishable in the root, from the officinal. The plant I have not had an opportunity of examining; we use it in the preparation of the officinal compounds. It could probably be obtained in quantities.

Punica granatum is much cultivated in the gardens for ornament and use. While in bloom the beautiful bell-shaped flowers are quite attractive. The fruit is generally esteemed, and its rind as well as the bark of the root used medicinally.

Hedeoma pulegioides covers our hill sides in the open woods and old fields. It may be mown with the scythe and raked like hay. With apparatus for distillation, the oil could be obtained on a large scale.

Humulus lupulus grows finely with us. My garden supplies my retail trade with a quality for which I realize double the prices usually obtained for the commercial article. Little or no attention is given to their cultivation by our farmers.

Linum. No attention is paid to the growth of flax except upon a very small scale for the seed used medicinally. Oil is not made at all.

Lobelia inflata, although not indigenous to our soil, has been introduced in places among us, and we are occasionally offered both herb and seed.

Maranta has never been tested in this section ; a few plants obtained by the writer some years ago died, and the experiment has not since been repeated.

Mel. Much attention is given to the production of honey for the home market, and small quantities of wax are sent abroad. Wild bees are frequently found in our forests, where they deposit honey in the hollow trees. They are marked, and in due season the tree is felled, and the mangled comb extracted and brought to market. A more than ordinary courage is required for success in this undertaking. The honey is inferior in color and flavor to that of the domesticated bee.

Mentha piperita and *viridis* are easily established in our soil, and take the ground completely, producing abundant crops of herb. This plant, in our hot climate, abounds I think more largely in the essential oil than in the State of Michigan, where I have observed it in cultivation. There seems every reason to believe that the manufacture of the oil of peppermint would be quite profitable here under judicious management.

Monarda is abundant in old fields and along the road sides. No use is made of it.

Amygdalus communis. The almond, both sweet and bitter, have been grown successfully in the middle portion of Georgia. I know of no attempt having been made here.

Olea Europæa. Efforts have been made with success to introduce the olive upon our seaboard. It has not been attempted here.

Ricinus communis is found occasionally along our road sides. No use is made of it. It is said to drive moles from the gardens where it is grown.

Terebinthina. During a few years, the production of turpentine, rosin, and spirits has made some progress in our State. In my own immediate neighborhood the manufacture is as yet quite limited ; not more being produced than is consumed in the counties immediately around us. The rosin accumulates on hand, and no arrangements are yet made for shipping it. Our distance from the seaboard precludes the probability of shipping it to advantage. Some experiments have been made in the distillation of the rosin-oil, and it is probable it may be advantageously disposed of in this way. The spirits is distilled from large

cast iron pots upon which are luted tin or sheet iron caps, and the vapor is condensed in the ordinary copper worm. No water is introduced with the turpentine. The heat is badly applied, so that a portion of the rosin is often decomposed, and the spirits somewhat contaminated with rosin-oil. When brought to us fresh from the still, the oil of turpentine is almost wholly free from the odor and taste termed terebinthinate, which it acquires by exposure. The flavor of pine bark freshly stripped from the tree, is scarcely, more acceptable than the recently distilled oil.

Podophyllum peltatum is very abundant in low, moist woods. In many spots the roots may be obtained almost as rapidly as potatoes from the cultivated field, so thickly do they grow. It is much used in domestic and steam practice.

Prunus Virginiana is very abundant, and much used, both the bark and berries.

Sanguinaria is found abundantly scattered all through our forests. Much used under the name puccoon root.

Menispermum Canadensis is very abundant in low grounds along our rivers and small streams; much used as a tonic and alterative. It almost entirely replaces the *Smilax officinalis* with us.

Sassafras overruns our waste lands, and is usually considered a never failing indication of the poverty of the soil upon which it grows. Sassafras tea is a panacea with many; the pith is also much used.

Senega is found easily for domestic use. Whether it could be obtained in quantities sufficiently large to make it an article of regular export, I am unable to say.

Serpentaria is much more abundant, and could I think be made profitable. This is also much used. Two varieties are found and used indiscriminately. The distinctions between the two I have not examined with any care; they are probably contained in the books.

Spigelia is very abundant. It is occasionally offered in small lots for sale. It has gone much out of use with us.

Stillingia is indigenous, and used to some extent. I have not found it very abundant.

Stramonium is our "jimson" weed—a great pest.

Taraxacum is never found indigenous in our soil.

Ulmus. Our elm does not yield so mucilaginous a bark as that obtained from the Northern States.

Zingiber does not bear our climate well, unless it be protected during the winter. Besides the plants named, we have many which are used only in domestic and steam practice. With a few exceptions, we are unable to obtain a home supply of medicinal plants.

From the Proceedings of the American Pharmaceutical Association.

ON COLLODION.

By L. HOFMANN.

The author has occupied himself with the preparation of collodion for photographic purposes, and recommends the following process, which may also be rendered applicable in surgery by additions. The best addition is castor oil, to deprive the collodion of the property of contracting so strongly and becoming cracked.

1 part of loose, clean cotton-wool is immersed for a quarter of an hour in a mixture of 20 parts of dry nitrate of potash, and 30 parts of English sulphuric acid, in a suitable glass vessel, capable of being closely covered with a glass plate. During this time it is once strongly stirred. The mixture is then poured into a pail of pure water, and well washed, and this operation must be repeated until the last traces of salt and acids are removed. The xyloidine obtained is then put into a linen cloth, pressed sharply, and teased out before drying, so as to remove all knots. The drying is effected upon a common stove in a suitable sieve.

Schacht has already recommended the same proportions, but has not prescribed the employment of the dried salt, and he has also confined the time of action to 4-5 minutes. Xyloidine thus prepared did not dissolve so readily and completely in the mixture of ether and alcohol, and the preparation in course of time lost the property of dissolving easily. 6 parts of xyloidine, obtained by the above process, were dissolved by shaking in a mixture of 120 parts of ether, and 8 parts of the most highly rectified alcohol, and 3 parts of castor oil were added to the solution.—*Chemical Gazette*, October 15, 1856, from *Archiv der Pharm.*

ON THE ACTION OF WATER UPON GLASS.

By J. PELOUZE.

The author refers to the observations of Scheele, Lavoisier, Chevreul, and other chemists, upon the action of water upon glass, but remarks that no one has yet attempted to determine the extent of the alteration thus produced. The action of water upon glass reduced to powder is the principal object of his memoir.

The action of boiling water is excessively slow upon glass vessels in which it is boiled, and when cold it has still less action, but it decomposes powdered glass with extraordinary ease. Thus a bottle of half a litre scarcely loses 1 decigram. when water is boiled in it for five whole days; but if the neck be cut off and powdered and boiled in the same vessel for the same time, it loses nearly a third of its weight. The same vessel which has contained water for years without losing appreciably in weight, will lose 2 or 3 per cent. in a few minutes by simple contact with cold water when pulverized. The following are the results of some of the author's experiments:—

1. A specimen of white glass, of the best commercial quality, consisting of—

Silica	.	.	.	.	72.1
Soda	.	.	.	.	12.4
Lime	.	.	.	.	15.5
Alumina and oxide of iron	.	.	.	.	traces,

was very finely powdered on a plate of agate; 5.510 grms. were boiled in a porcelain capsule with frequently renewed distilled water. The clear liquids were evaporated and the residue calcined; it weighed 0.175.

The portion insoluble in water was treated with water acidulated with muriatic acid, when a pretty brisk effervescence was observed. The muriatic acid solution was saturated with ammonia, which produced a slight precipitate (alumina), an excess of oxalic acid was added, the oxalate of lime was collected, washed, dried, and decomposed by sulphuric acid; it gave 0.190 of sulphate of lime, representing 0.078 of lime, or 1.5 per cent. of the weight of glass employed. The glass containing 15 per

cent. of lime, we may conclude that the water had decomposed about 10 per cent. of the glass.

2. Another white glass, also of the finest quality, composed of—

Silica	77.3
Soda	16.3
Lime	6.4
Alumina and oxide of iron	traces.

5.180 grms. of glass were operated upon in precisely the same way as the last. The residue of the aqueous solution was 0.945 grm.; the weight of the sulphate of lime, 0.250, representing 0.103 of lime, or two per cent. of the weight of glass. The glass containing 6.4 per cent. of lime, 32 per cent. of the glass must have been destroyed. The residue of the aqueous solution contained 0.281 grm. of soda, or 5.6 per cent. of the weight of the glass: the remainder was silica. The glass containing 16.3 per cent. of soda, 34 per cent. of glass had been attacked.

The composition of the silicate of soda dissolved in the water was $3(\text{SiO}_3)_2\text{NaO}$; at 302°F . it retained 2 equivs. of water.

3. The two kinds of glass just mentioned were agitated for a few minutes with cold water, a few drops of weak muriatic acid were added to the mixture, which was filtered immediately. The loss of weight of the glass and the amount of lime collected showed that the glass had lost 2 to 3 per cent. by this simple contact with cold water.

By boiling for a few minutes, the same glass lost nearly double, or between 5 and 6 per cent.

4. All sorts of commercial glass, when finely powdered and exposed to the air, are slowly decomposed, absorb carbonic acid by degrees, and after some time effervesce briskly with acids. The same effervescence takes place with acids in a mixture of powdered glass and water which has been left in the air for a few days. The acid water contains a large quantity of soda and lime.

Sulphuric acid also is almost always found; as most glasses contain sulphate of soda, varying in weight from one or two-thousandths to two-hundredths.

5. Finely-powdered glass, boiled with water into which a cur-

rent of carbonic acid is passed, absorbs this gas in a few moments, and afterwards effervesces briskly with acids.

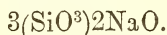
6. Powdered glass, boiled for several hours with sulphate of lime, produces a considerable quantity of sulphate of soda. This reaction explains why the walls and floors of workshops, in which plate-glass is polished, are always covered with an efflorescence of sulphate of soda. The plaster which serves to fix the glass furnishes the sulphuric acid, and the glass the soda, of which this salt is composed.

7. All glasses reduced to fine powder immediately restore the blue color of red litmus-paper and tincture, and change syrup of violets to green. Powdered glass which has undergone the action of cold water, continues to alter in boiling water.

8. Crystal-glass in fine powder, agitated for a few minutes with water containing a very small quantity of acid, gives a black deposit of sulphuret of lead by treatment with sulphuretted hydrogen. After half an hour's ebullition with water and the addition of an acid, 5 grms. of crystal in powder furnished 0.050 of sulphuret of lead, representing a decomposition of about 3 per cent. Flint-glass, which contains still more oxide of lead, undergoes a still more considerable decomposition.

Devitrified glass behaves like ordinary glass with water, except that it appears to be still more easily decomposed.

After boiling for five days, a specimen of glass similar in composition to the first-mentioned had undergone a decomposition corresponding to a third of its weight, and the silicate of soda yielded by it had also the formula—



Thus powdered glass is decomposed by contact with water or air with an ease and rapidity which appear very extraordinary, considering the great stability of vessels formed of cast or blown glass. Is the surface of the glass in this form in a particular state, which modifies its properties? This does not appear probable when we consider that plate-glass, from the surface of which several millimetres have been removed in polishing, is equally, if not more permanent in moist air and water than common glass, and that in all cases the crude plate-glass presents neither more nor less resistance to atmospheric agents than the others. The author regards the difference in action of water upon glass

in these two forms as due only to a different cohesion and mechanical resistance. The multiplicity of surfaces, and the facility of movement in the powder, hasten its alteration in water.—*Chem. Gaz.*, Sept. 15, 1856, from *Comptes Rendus*, July 21, 1856, p. 117.

DETERMINATION OF THE AMOUNT OF THÉINE IN GUARANA.

By JOHN STENHOUSE, LL. D., F. R. S.

Guarana, as is well known, is a species of chocolate, manufactured from the fruit of the *Paullinia Sorbilis*, by the aboriginal tribes of Para, and other districts in Brazil, and extensively employed by them both as a refreshing beverage, and as a remedy against dysentery and similar diseases.

The presence of théine in guarana was first discovered many years ago by Dr. Theodore Martius, of Erlangen, and his observations were subsequently corroborated by Messrs. Berthemot, Dechastelus, and C. Jobst.

As none of these gentlemen, however, made any determination of the amount of théine in guarana, I thought it might be of some interest to supply the omission, especially as I had previously determined the quantity of théine present in all the other substances known to contain that alkaloid. Through the kindness of my friend John Miers, Esq., F. R. S., the well-known Brazilian traveller, I have recently been enabled to subject guarana to a new examination.

The specimen of Guarana, given me by Mr. Miers, was about seven and a half inches long, one and a quarter inches thick, and weighed nearly three-quarters of a pound. It had a rough corrugated surface, dark brown color, no odor, and a somewhat amygdaloidal fracture.

Twenty-five grammes of the specimen were very finely powdered, and boiled with one quart of distilled water for some time. When cold, a slight excess of basic acetate of lead was added, when a bulky brownish-red precipitate fell. This was repeatedly digested with hot water, and the clear liquid which passed through the filter was treated with a slight excess of sulphuretted hydrogen, till all the lead present in it was precipitated. The clear solution was then evaporated to dryness on the water-bath, and the resi-

due dissolved in a small quantity of boiling alcohol, and filtered. The filtrate was allowed to evaporate nearly to dryness, when yellowish-colored crystals were deposited. These were pressed between folds of bibulous paper and recrystallized out of spirits of wine, when they were rendered perfectly colorless. After being dried on the water-bath, they were weighed, when the twenty-five grammes gave 1.260 grammes, equal to 5.04 per cent.

A second determination, in which fourteen grammes were used, gave 0.715 grammes, equal to 5.1 per cent.

Average of the two determinations, 5.07 per cent.

In addition to théine, guarana contains a coloring matter, apparently analogous to the tannin in cinchona bark, and likewise a fatty matter which, like the fat of chocolate, does not appear to become rancid by keeping.

From an inspection of the subjoined table, it will be seen that guarana is the richest known source of théine:—

	Per cent. of Théine.
Guarana	5.07
Good Black Tea	2.13
Black Tea from Kemaon, E. I.	1.97
Various samples of Coffee Beans, from 0.8 to	1.00
Dried Coffee Leaves, from Sumatra	1.26
Paraguay Tea, from <i>Ilex Paraguayensis</i>	1.2

Pharmaceutical Journal, October, 1856.

ON A NEW MODE OF PREPARING RED OXIDE OF IRON ("ROUGE") FOR POLISHING GLASS AND METALS.

By M. A. VOGEL, Jun., of Munich.

We ordinarily use for polishing glass and metals, red oxide of iron (*colcothar, caput mortuum vitrioli*), which is procured in various ways, either by heating sulphate of iron alone or previously mixed with common salt, or by several other means. All these processes have, however, the inconvenience, that it becomes indispensable to wash the powder for a long time, in order to separate the finer from the coarser and harder parts. Even by long continued washing, it is difficult to arrive at absolute security in using it, without running the risk of wasting the labor of

several weeks, in consequence of the remains of coarse parts which have not been separated, notwithstanding the long washing. Therefore, a colcothar capable of being employed with safety is always in great demand and of high price.

These circumstances have induced me to seek a new process for procuring a colcothar which should be preferable to that prepared in the ordinary manner, however carefully washed.

Numerous experiments have shown me that the decomposed oxalate of protoxide of iron presents the proper means for accomplishing this object.

The oxalate of protoxide of iron heated in a close vessel out of contact with the air, gives iron pyrophorus, that is to say, metallic iron so finely divided that it inflames on contact with the air, and red oxide of iron is formed. This transformation takes place very rapidly, when we heat the oxalate of protoxide of iron in the air on a sheet of platinum, during which operation the matter undergoes a considerable augmentation of bulk.

Owing to the carbonic acid and carbonic oxide gases which are disengaged at this high temperature, the substance is thoroughly divided, and during this disengagement of gases, it absorbs oxygen from the air. We have consequently, in the disengagement of gases and in the absorption of oxygen, a means of reducing the oxide of iron to the state of as fine a powder as possible.

In order to procure colcothar according to the mode indicated, we operate in the following manner; into a solution of sulphate of iron made with boiling water and filtered, we pour a concentrated solution of oxalic acid, until no more yellow precipitate of oxalate of protoxide of iron is formed. When the liquid is quite cold and deposits nothing more, the precipitate is washed on a cloth with hot water until the washing water no longer gives an acid reaction.

The oxalate is afterwards heated in the partially dry state on an iron plate or in a boiler of the same metal, over a small charcoal fire or even a spirit lamp. The decomposition commences at the temperature of 200° C. (392° F.) and on raising the temperature a little, the red oxide of iron is formed, and is found in the finest possible state.

The colcothar formed by this mode affords perfect security of

the finest division of the product, and may be employed with the greatest success for polishing plate glass and the glasses used by opticians, without any previous washing.

The trials which have been made of this colcothar, in the arts, for polishing metals, principally gold and silver, have demonstrated that the finest polish may be obtained without even scratching the surface, therefore it may be employed for polishing Daguerreotype plates, telescopes and other objects of that kind. Moreover artizans have found that, by employing this colcothar, the operation of polishing glasses is very greatly accelerated.

Chemist, Nov., 1855, from Jour. de Pharm., July, 1854.

THE GUMS AND RESINS OF COMMERCE.

By P. L. SIMMONDS.

The subject which I have undertaken to open up for discussion this evening, is one embracing so many important articles of commerce, and extending over so wide a field of research, that I can scarcely hope to do common justice to any even of the great classes into which it naturally divides itself—much less to enumerate or particularize one-half of the various new gums and resins which I should desire to bring more prominently into notice. Any one of these gums or resins would have formed ample field for investigation and inquiry of itself, taking it in its several relations of origin, sources of supply, mode of procuring, quantity obtainable, price, chemical composition, and probable utility, as compared with other similar exudations and their commercial uses.

But in taking a rapid survey of the whole group of gummy and resinous exudations, any such close and full description would be utterly impossible—and as it is, I shall have to pass over much of the information I have arranged, leaving it for the quiet perusal and future consideration of those who feel greater interest, in its more extended form in the columns of the Society's *Journal*.

In the mode of treating my subject I hesitated at first as to whether it might not be useful to go over each quarter of the globe separately, giving distinct accounts of the gummiferous plants and products of Europe, Africa, Asia, Australia, and

America. But on reflection I found that this would entail much repetition, and I am, therefore, necessitated to fall back on the conventional classification usually adopted of true gums, resins, gum resins, oleo resins, and elastic gums, and I hope to be able to furnish something new to our current stock of information under each of these heads.

The importance of this class of commercial products will be better estimated by the statistics I shall be able to furnish of the trade, brought down to within the last year or two.

That there has long been a want of some more detailed information on the gums and resins of commerce will not be denied, for, although much has of late years been done by the several local and metropolitan exhibitions to collect and diffuse correct information, we are still lamentably deficient in details as to the plants that produce very many; and the learned Professor who presides on this occasion, knowing himself how difficult it is to identify plants without the presence of the leaves, barks, and necessary adjuncts, will readily be able to excuse any accidental errors I have fallen into, which his more experienced judgment may be able to correct. Much information respecting the gum-bearing trees of commerce and their products is doubtless to be found scattered through many home and foreign scientific periodicals, but this bears rather on their medicinal value than on their commercial properties and uses in the arts and manufactures, and grave errors continue to be propagated in standard works from day to day; even in a publication of weight and influence like the "*Encyclopædia Britannica*," most of the details in the articles as given in the new edition (as far as it has proceeded,) are nearly reprinted verbatim as issued in its pages some thirty or forty years ago.

There is another work of assumed authority, where one would naturally look for some recent information as to the progress of discovery in new gums and their applications, viz., *Dr. Ure's Dictionary of Arts and Manufactures*; but in the last edition of 1853, the article "Gums" stands verbatim as it did in the edition fifteen years previous, brief and meagre in its character, while that on Resins has merely an addenda of a page to the previous stereotyped matter.

Every one who brings the result of his researches and investigations to bear into the common stock, if he has been diligent and treated the subject fully and fairly, must contribute some few hints that may prove useful, and if I but succeed in doing this, I shall be satisfied.

I must premise that in order to assimilate my information to the erroneous nomenclature of city circles and commercial lists, I am obliged to depart to some extent from the true scientific definition, and shall speak frequently of many substances as "gums," which are properly gum resins, or pure resins. Were I not to do this, I should confuse many of those whom I see around me, and who have had to buy and sell by names which were erroneously given years ago, before chemical analysis had determined the true composition of many.

It has been well observed by Professor Solly (*Jury Reports*, p. 71), that "a great deal of practical inconvenience and confusion is caused by the indiscriminate manner in which the term *gum* is used in commerce and the arts. It would certainly be an advantage if the distinctions employed in scientific books, were to be generally adopted by merchants and drug-brokers, the term *gum* being solely applied to those natural vegetable exudations which soften or dissolve in water, and yield a more or less perfect mucilage, but which are wholly insoluble in spirit; the term *resin* being applied to those fusible and combustible vegetable substances which are quite insoluble in water, but which soften and dissolve in ether, the "essential oils," and "spirits of wine," and the term *gum resin* being used to designate those mixtures of gum and resin which are intermediate in properties, and partake of the nature of each, being partially and imperfectly soluble both in water and in alcohol."

Gum, properly so called, is used in large quantities for a number of purposes in the arts. It is generally distinguished into soluble gum, or gum Arabic, which readily and perfectly dissolves in water, forming a clear mucilage, and cherry-tree gum, or gum tragacanth, and those difficultly-soluble kinds of gum, which, though they soften easily, do not readily form mucilage. Gum is extensively used in finishing and giving lustre to crapes, silk goods, &c., by calico printers, shoemakers, and in other trades.

As instances of the immense traffic carried on in gums, I may

state that one Liverpool firm imported in three years Gum Senegal to the value of £100,000. Gums to the value of 3¼ millions of francs have been shipped annually from Alexandria. The exports from Morocco reach to 250 or 300 tons, and India exports 1500 or 1600 tons.

The Gum Arabic of commerce is the produce of various species of acacia, which yield this substance in considerable quantities, particularly *A. vera*, a native of Arabia, and of Africa, from Senegal to Egypt, which supplies the finest qualities; *A. Arabica*, a smaller tree, common in India and Africa, which yields part of the Turkey and East India gum; the red pieces constituting the gum gedda and gum babool of commerce.

A. gummifera, a high, thorny tree, found near Mogador, the coast of Guinea, and in Arabia, furnishes what is known as Barbary gum, a darker variety.

A. Senegal yields part of the Senegal gum, the tears of which are usually in larger masses than *Arabic*, of a darker color, and more clammy and tenacious. The trade in this variety is chiefly in the hands of the French, and we have imported supplies occasionally from France.

In the Cape colony, gum is collected by the Kaffirs from a species of *Acacia* closely resembling *A. vera*, which Burchall, in his "Travels into the Interior," calls *A. Capensis*, the *A. karoo*, probably, of Hayne, Nies, and Ebermaier, which is abundant on the banks of the Orange River. It is of a pale yellow color, and is not considered by the dealers so good as that obtained in the more northern parts of Africa.

The ordinary Cape gum of commerce exudes spontaneously from the bark both of the trunk and branches of the thorn tree (*Acacia horrida*, Willd.).

A considerable trade was carried on by the Cape colonists a few years ago with Kaffirland for the gum gathered from the Mimosa tree. Wagon-loads were constantly being sent off to Port Elizabeth for shipment to the London market. It was extensively used by calico-printers, calenderers, makers of stationery, and in various industrial arts. The exports have declined from 4876 cwts. in 1849, to 72 cwts. in 1853. The reason for this decline is curious. By mere accident it was discovered that a gum could be manufactured from potatoes or wheat. This

article—now called British gum—dextrine, or gum substitute, has superseded the more expensive in almost every department of manufacture and art in which it was used—hence the demand for Kaffir gum is at an end. British gum is found to possess adhesive properties equal to gum Arabic, being less liable to be affected by climate; it is therefore used for postage-stamps, envelopes, &c., as well as in manufactures, and it can be produced for less than one-fourth the cost.

Some fortunes have been made by the discovery, which originated in pure accident, and which is stated to have been made as follows:—

A fire took place in a manufactory of starch from potatoes, near Dublin. The burning building was deluged with water from the fire-engines, and the starch washed about in every direction. A man fell down into the flood of calcined starch and water, but thought no more of it until next morning, when dressing himself he found the legs of his trowsers, sleeves of his coat, pockets, and every other opening firmly obstructed. On examination he thought he had fallen into gum, but on revisiting the scene of the fire he discovered that the properties must be contained in the potato starch, and by a few simple experiments he made a discovery which has resulted in large profits.

According to the statement of Dr. Vaughan, of Aden, the acacia which yields gum Arabic is generally a small shrub, of a dry and withered appearance; occasionally, however, it shoots out into a tree of from twenty to thirty feet high. The Somalis, on the north-east coast of Africa, collect the gum during the months of December and January. The process of obtaining it is extremely simple; long incisions are made in the stem and branches, from which the juice flows, and when dry is removed. After the gum of a district has been gathered, it is sewn up in goat skins, and brought on camels to the great Berbera fair, or to some of the smaller settlements on the coast, and thence shipped to Aden and India.

There are three descriptions of the gum, styled severally Felick, Zeila, and Berbera. None of the first-named, which is esteemed the best, finds its way to Aden, the mass being usually bought up by the Banians or Hindoo merchants, and shipped direct to Bombay, where it realizes about 50s. the cwt. The other two

named varieties are called after the ports of shipment, and only fetch about half the price of the Felick gum. In 1851, 250 tons of gum Arabic passed through the Aden custom-house, the selling price there being about 24s. the cwt.

The local names for the gum Arabic, or Summuk, are adad, wadi, and anhokib, of which the anhokib is considered the best. It sells at Bunder Murrayeh for $1\frac{1}{2}$ dollars per frasila of 20 lbs. The tree is found on the mountain sides, in good red soil, and varies in height from ten to twenty feet. The inferior qualities of gums are sold at a much lower rate.

During the hot season the men and boys are daily employed in collecting gums, which process is carried on as follows:—About the end of February or the beginning of March, the Bedouins visit all the trees in succession, and make a deep incision in each, pulling off a narrow strip of bark for about five inches below the wound. This is left for a month, when a fresh incision is made in the same place, but deeper. A third month elapses, and the operation is again repeated, after which the gum is supposed to have attained a proper degree of consistency. The mountain sides are immediately covered with parties of men and boys, who scrape off the large clear globules into one basket, whilst the inferior quality that has run down the tree is packed separately.

The gum when first taken from the tree is very soft, but hardens quickly. Every fortnight the mountains are visited in this manner, the trees producing large quantities as the season advances, until the middle of September, when the first shower of rain puts a close to the gathering of that year. Large quantities of gum Arabic are collected by persons in the employ of the Egyptian government, and brought to Cairo in the caravans to be warehoused. The annual return occasionally reaches to 20,000 packages of 78 lbs. each.

In Morocco, about the middle of November, that is, after a rainy season, which begins in July, the gummy juice exudes spontaneously from the trunk and principal branches of the acacia tree. In about fifteen days it thickens in a furrow, down which it runs, either in vermicular (or worm) shape, or commonly assuming the form of oval and round tears, about the size of a pigeon's egg, of different colors, as they belong to the white or

red gum tree. About the middle of December, the Moors encamp on the border of the forest, and the harvest lasts six weeks.

The gum is packed in very large sacks of leather, and brought on the backs of bullocks and camels to certain ports, where it is sold to the French and English merchants. It is highly nutritious. During the time of harvest, of the journey, and of the fair, the Moors of the desert live almost entirely upon it, and experience proves that six ounces of gum are sufficient for the support of a man twenty-four hours.

Gum is largely collected in Central Africa, and sent to the coasts of the Mediterranean and the oceans. Gum Arabic and Senegal to the value of £12,000 are exported; other sorts of gums to the value of £12,000, and resins and varnishes to the value of £6000. From Senegambia the quantity of gum exported is given at 25,000 quintals or cwt., of which 9000 go to France, 6000 come to this country, 4000 go to Portugal and the United States, and about 6000 are sent by the caravans of Fezzan and Morocco to other parts of Central Africa.

In the Indian bazaars, the products of a variety of trees are mixed and indiscriminately vended as gum by the native druggists. Among them are gum from the neem, the mango, the babool, (*A. arabica*), *Cassia auriculata*, cotton-tree, and several others. They are much inferior, however, to the gum of the *Acacia vera*.

A large quantity of excellent gum is procured in the East from the wood apple (*Feronia elephantum*), which much resembles gum Arabic in chemical and serviceable proportions, and from its ready solubility it gives the best mucilage for making black ink.

Dr. Wight tells us that good gums are obtained by the natives of Coimbatore from the following plants:—*Aegle marmelos*, *Prosopis spicigera* and *Acacia sundra*; and very fair kinds from *Melia azadirachta*, *Acacia odoratissima*, *Conocarpus latifolia*, *Soymeda febrifuga*, *Odina wodier* and some others.

The bastard ebony tree of Central India, and also many other of the forest trees which abound there, yield large quantities of rich and valuable gums. Dr. Spry collected as many as fifteen varieties in one locality.

There are more than 130 species of the acacia in Australia, and from them exudes the purest gum Arabic. It is so plentiful that at particular periods several pounds may be collected in some places in an hour or two. It possesses all the good properties of the gum from Arabia, and is used successfully for the same purposes in the colony. The *Acacia Senegal* or *Mimosa Senegalensis*, a tree rising fifteen to twenty feet high, affords the Senegal Gum of commerce, which does not differ essentially from the gum of *Acacia vera*, except in the shape, and being somewhat less soluble. In 1849 we imported 5696 cwt. of gum Senegal direct from Senegambia, and 256 cwt. from Morocco, whence the imports in 1853 reached to 2838 cwt. In 1840, we imported 601 cwt. from the Gambia, and in 1851, 850 cwt. of gum Senegal, but none in subsequent years. In the Algerian collection at Paris, mention is made of Mesteba, an indigenous gum of Northern Africa, of which little seems to be known, except that it forms an article of traffic at the markets of the oases in the Algerian desert.

Another white gum, called Aourouar, is also spoken of, and which is said to be shipped to England by the way of Souira; a darker gum yielded by a tree called toleukh, is brought by the caravans from Timbuctoo. These are probably some of the darker and less valuable gum Arabics which come into commerce under the name of Barbary and other gums.

MEZQUITE GUM.—Attention has recently been called in the United States to the discovery, in great abundance, of a species of acacia, known as the mezquite tree, which furnishes large quantities of gum, nearly equal to the gum Arabic of Africa. It will no doubt prove a valuable source of revenue to the State of Texas, New Mexico, and the adjacent Indian territory, besides affording employment to the different tribes of Indians, now roving upon the plains, many of whom would be glad to gather and deliver it to the different frontier government posts for a very small compensation.

The mezquite is by far the most abundant tree of the plains, covering thousands of miles of the surface, and always flourishes most luxuriantly in elevated and dry regions. The gum exudes spontaneously in a semi-fluid state from the bark of the trunk and branches, and soon hardens by exposure to the atmosphere,

forming more or less rounded and variously-colored masses, weighing each from a few grains to several ounces. These soon bleach and whiten upon exposure to the light of the sun, finally becoming nearly colorless, semi-transparent, and often filled with minute fissures. Specimens collected from the trunks of the trees, were generally found to be less pure and more highly colored than when obtained from the branches.

The gum may be collected during the months of July, August, and September; but the most favorable period for that purpose is in the latter part of August, when it may be obtained in the greatest abundance, and with but little trouble. The quantity yielded by each tree varies from an ounce to three pounds; but incisions in the bark not only greatly facilitate the exudation, but cause the tree to yield a much greater amount. As it is, a good hand will probably be able to collect from ten to twenty pounds in a day. Were incisions resorted to, double the amount might be obtained.

A simple, pure gum, was recently shown at Madras, obtained in Travancore, from the *Macaranga indica*, which has been used for taking impressions of leaves, coins, medallions, &c. When the gum is pure and carefully prepared, the transparent impressions are as sharp as those of sulphur, without its brittleness. The exudation appears to be an entirely unknown production.

Keekur gum, a variety of Arabic, is produced by *Vachillia farnesiana*. *Acacia sirissa* in India yields a large quantity of a clear gum known as Dirisani gum, and closely resembling Keekur gum. Booraga, obtained from *Bombax malabriculum*, is a pure gum.

TRAGACANTH is a gummy exudation, obtained from various species of *Astragulus*; *A. verus* (Olivier), *Gummifera creticus* (Lamarck), which is imported for medicinal purposes from Smyrna and other ports in the Levant, to the extent of about five or six tons per annum. It is obtained principally from Northern Persia, Asia Minor, and America. Hamilton (Researches in Asia Minor, &c.,) states that tragacanth, which is called by the Turks "kittereh," is collected in large quantities in the hills about Buldur, from a low prickly plant, resembling a species of furze. The white flaky gum is obtained by making an incision in the

stems near the root, and cutting through the pith, when the sap exudes in a day or two and hardens in the opening, after which it is collected by the peasants. Its price there was about 3s. 2d. per lb. ; 23 tons were imported in 1850 from Smyrna, and the imports have since annually increased, until in 1853 they reached nearly 70 tons.

A spurious tragacanth is obtained in the East from the *Sterculia urens* and *S. foetida*, and an inferior tragacanth is also procured from *Cochlospermum gossypium*.—*Journ. Frank. Inst. from Journ. Society of Arts, London, Nov. 1855.*

(To be continued.)

ON THE SUPERPHOSPHATE OF DECOMPOSED BONES.

By W. WICKE.

Starting from the supposition that the acid phosphate of lime in the bones is very soon converted into neutral phosphate in the soil, the opinion has been set up that the superphosphate only acts by its fine state of division. It has even been recommended to precipitate again the acid phosphate of lime rendered soluble by sulphuric acid by means of lime, and to incorporate this with the soil.

As far as I am aware, no experiments have been made upon the behaviour of the superphosphate towards the ordinary constituents of the soil, which may have a neutralizing action upon it ; I mean towards carbonate of ammonia, as the ordinary product of decomposition of the organic constituents of urine and carbonate of lime. Both these bodies certainly have a decomposing action upon the superphosphate, but not of such a nature as to separate the whole of the phosphoric acid in an insoluble compound. In the former case a sufficient quantity of phosphate of ammonia for the requirements of the plants, and in the second an acid salt, remains in solution.

For this experiment I employed very pure marl. If the superphosphate be filtered through the marl, or left in contact with it for a long time, a portion of the phosphoric acid is certainly combined with evolution of carbonic acid, but the salt is not entirely precipitated. Even in this case we present immediately to the plant a phosphate which is soluble in water.

The soluble salts of iron have an injurious action upon decomposed bones as a manure. A loss must take place. A solution of sulphate of iron immediately produces a white precipitate with an aqueous solution of superphosphate, and this perceptibly increases, so that the greater part of the phosphoric acid is soon separated as an insoluble iron-salt.

Bones decomposed with sulphuric acid are extracted with water at a gentle heat. The yellowish filtrate has a strongly acid reaction.

15 cub. centims. of solution contained 0.0103, or 0.0686 per cent. of sulphuric acid, and 0.0225 or 0.15 per cent. of lime, leaving 0.0153 of lime for the phosphoric acid.

15 cub. centims. of the solution contained 0.1047, or 0.698 per cent. of phosphoric acid. The equivalent proportion of the lime to the phosphoric acid is therefore as 1 to 3.

15 cub. centims. of the solution were mixed with carbonate of ammonia until the production of a weak alkaline reaction. A strong white precipitate was produced, which gave on analysis 0.043, or 0.286 per cent. of lime, and 0.0313, or 0.2086 per cent. of phosphoric acid. Proportion of lime to phosphoric acid as 1 to 3.

The filtrate still contained 0.0706, or 0.4706 per cent. of phosphoric acid. The whole quantity of phosphoric acid was 0.1047

Obtained	0.1019
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Loss	0.0028
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Experiment with Marl.—The superphosphate remained for several days in contact with the marl. It was then filtered, and the fluid brought to its original quantity (15 cub. centims.). The filtrate had an acid reaction. It contained 0.101, or 0.073 per cent. of lime, and 0.0783, or 0.5835 per cent. of phosphoric acid.

From these experiments it appears that it is not advisable to convert the superphosphate again into tribasic phosphate of lime by the addition of lime. By the action of ammonia upon the acid product, the desired state of fine division is at once produced, whilst another portion of the phosphoric acid can be drawn up by the plants in the form of phosphate of ammonia at the commencement of vegetation. This is also the case when carbonate of lime acts upon the superphosphate.—*Chemical Gazette, September, 1856, from Liebig's Annalen, July, 1856.*

Varieties.

Solubility of Gallic Acid in Glycerin. By THOMAS WEAVER, Pharmacist, Philadelphia.—I notice in the last number of the *Reporter*, an article headed "A New Astringent Preparation;" the concluding remark of the writer is as follows: "It is singular that glycerin does not possess the same property towards gallic acid" (*i. e.* to dissolve it). In some experiments that I performed last spring, I found gallic acid to be soluble in glycerin to the extent of 40 grains to the ounce, which solution may be diluted to an unlimited extent with water without precipitating the acid. I have been led to make this communication from a belief that such a solution might be of use where the peculiar chemical effect of tannic acid on animal tissue might be objectionable.—*Med. and Surg. Reporter.*

Cure of Itch in half an hour by use of Sulphur in a liquid form.—Dr. E. Smith called the attention of the Fellows of the Medical Society of London to an article in the *Gazette Hebdomadaire*, by Dr. Bourguignon, in which is a confirmation of the value of the treatment of itch, in Belgium, by sulphur, combined with lime in a liquid form. The remedy is prepared by boiling one part of quick-lime, with two parts of sublimed sulphur, in ten parts of water, until the two former are perfectly united. During the boiling it must be constantly stirred with a piece of wood, and, when the sulphur and lime have combined, the fluid is to be decanted and kept in a well-stoppered bottle. A pint of the liquid is sufficient for the cure of several cases. It is sufficient to wash the body well with warm water, and then to rub the liquid into the skin for half an hour. As the fluid evaporates, a layer of sulphur is left upon the skin. During the half hour the *acarus* is killed, and the patient is cured. It is only needful then to wash the body well, and to use clean clothes. In Belgium, the treatment is introduced by first rubbing the body for half an hour with black soap, but this does not appear to be necessary. The only essential act is that of the careful application of the fluid sulphur. The lime is of no importance in the treatment, except to render the sulphur soluble, and such would probably be the case if potass or soda were employed. The chief point in the plan thus employed, which is an improvement upon the mode of application of sulphur in lard, is the more ready absorption of the remedy, and consequently the more certain and quick destruction of the insect, by using sulphur in a fluid form. In so disgusting a disease, it must be of great moment to be able to cure it in half an hour.—*Med. Times and Gaz., March, 1856.*

Vitis Vinifera.—(Grape-vine).—Dr. Simmons, of Georgia, recommends the root as a diuretic. He burns it to ashes, and then adds two table-spoonfuls of the ashes to a pint of boiling water, and the patient drinks of this *ad libitum*; or, he adds, in some cases, two ounces of bitartrate of potash. He has cured cases of anasarca by giving the above quantity daily.—*Memphis Medical Recorder*.

[Dr. Simmons can hardly mean that grape-vine ashes possess any peculiar effect beyond the alkali they contain? Will not hickory ashes and poke-weed (*Phytolacca*) ashes, both of which contain much potash, answer equally well?—ED. AM. PHARM. JOUR.]

Poisoning from swallowing Chloroform.—The *Philadelphia Medical Examiner* contains an interesting case of death following the ingestion of about one ounce and a half of chloroform, diluted with about the same quantity of water. The patient was an intemperate woman, who swallowed the liquid by mistake, supposing it to be sweet spirit of nitre. The first symptoms were those of intoxication, followed by insensibility, stertorous breathing, slow and feeble pulse, and great contraction of the pupils. She lived for about thirty-six hours, and died asphyxiated, having recovered her senses for several hours before death. The stomach was paler than usual, except in streaks a quarter of an inch in width, from which it was inferred that the organ had been thrown into folds by the irritation of the chloroform, so that only a portion of its surface had been acted on. The mucous membrane was much softened.

Spender's Chalk Ointment in Ulcers of the Leg.—Dr. Patterson has collected 125 cases of chronic non-specific ulcers of the leg, in which, under this mode of treatment, the cure has been rapid and complete. The following formula he prefers: R. Cretæ preparatæ, 4 lb.; adipis suilli, 1 lb.; olei olivæ, 3 oz. Having heated the oil and lard, add gradually the chalk, finely powdered.

The ointment and a bandage being once applied, it is left until the cicatrix forms and becomes firm.—*Edinburg Medical Journal*.

Iodide of cadmium.—This new preparation of iodine is coming into general use in hospital practice, in place of iodide of lead and iodide of zinc, as it makes a white ointment more effectual in dispelling glandular enlargements, and not so like paint as iodide of lead.—*Assoc. Med. Journ.*

Squills will kill Rats.—It should be generally known that powdered squills is destructive to rats. Mixed with strong-scented cheese in equal proportions, it is said, when eaten, to kill them very speedily.—*Nashville Journal of Med. and Surg.*

Poisoning by Oil of Turpentine.—Marechal of Tours mentions a case of poisoning by oil of turpentine, caused by a woman living for several days in a recently painted room. The symptoms were those of painter's colic. He considers that this disease is not produced, as is usually supposed, by the white lead, which is non-volatile, but by the evaporation of the oil of turpentine, whose poisonous action he has proved by several experiments. *Revue Medicale.*

Paper from Moss.—A Dr. Terry of Detroit, who has been experimenting on a half ton of moss obtained in Lake Superior region, according to the Cleveland Plaindealer, affirms that it makes beautiful white paper without any peculiar process. The moss is represented to exist in great quantities on Isle Royal and several other localities in the vicinity, and can be procured at a very moderate cost.

Cod-Liver Oil Chocolate.—Numerous attempts have been made to disguise the nauseous taste of cod-liver oil, and to render it more acceptable to delicate stomachs. The chocolate, it is said, is likely to remove the objections heretofore urged against its use. It is odorised with cinnamon, bitter almonds, peppermint, etc., so as to give it an agreeable flavor, and to cover perfectly the fishy taste of the oil. The prepared oil chocolate, it is stated, agrees well with even the most delicate stomachs, and is eminently adapted to all diseases of a debilitating character.—*Monthly Stethoscope and Medical Reporter.*

Death from Drinking Naphtha.—The London Lancet records a case of death from drinking about three ounces of naphtha, used for burning in lamps. The patient was a lad twelve years of age. The symptoms were at first those of excitement, speedily followed by stertorous breathing and a state of collapse. Death took place in less than three hours. At the post-mortem examination, the preservative action of the naphtha was very remarkable. The weather was very hot, and although three days had elapsed since death, all parts of the corpse were as fresh as if the lad had recently died. The blood was everywhere very fluid. The lungs were not at all congested, and the coats of the stomach were found to be very little affected by the presence of the poison. The smell of naphtha pervaded the whole of the tissues, and was very perceptible immediately on opening the head.

Leeches.—In the travels of Joseph Dalton Hooker, M. D., through Sikkim and Nepaul Himalayas, the following statements occur:—

“Leeches swarmed in incredible profusion in the streams and damp grass, and among the bushes; they got into my hair, hung on my eyelids,

and crawled up my legs and down my back. I repeatedly took upwards of a hundred from my legs, where the small ones used to collect in clusters on the instep; the sores which they produced were not healed for five months afterwards, and I retain the scars to the present day. . . . Another pest is a small midge or sand-fly, which causes intolerable itching and subsequent irritation, and is in this respect the most insufferable torment in Sikkim; the minutest rent in one's clothes is detected by the acute senses of this insatiable blood-sucker, which is itself so small as to be barely visible without a microscope. We daily arrived at our camping ground, streaming with blood, and mottled with the bites of peepsas, gnats, midges, and mosquitoes, besides being infested with ticks." (Vol. II. p. 18). "A large tick infests the small bamboo, and a more hateful insect I never encountered. A traveller cannot avoid these insects coming on his person (sometimes in great numbers) as he brushes through the forest; they get inside his dress and insert the proboscis deeply without pain. Buried head and shoulders and retained by a barbed lancet, the tick is only to be extracted by force, which is very painful. I have devised many tortures, mechanical and chemical, to induce these disgusting intruders to withdraw the proboscis, but in vain." (Vol. I. p. 166.)

Apothecaries in Valparaiso.—They are chosen weekly,—to keep their shops open all night. In case of sickness among the citizens, requiring medicine after evening hours, the nearest *vigilante*, or as we say, policeman, is called. He takes the recipe and passes it to the next, and so on to the shop open for that night, and the remedies are immediately returned to the house, through the same expeditious channel, without trouble to the sick.—*Life Illus.*

Poison of the African Toad.—The Rev. Francis Flaming's recent work on Southern Africa, has the following in relation to reptiles of that region. There is a monster toad there which has more terrifying celebrity than the puff-adder. It is about a foot long and eight inches broad, with a spotted green back, yellow belly, and large red eyes, which the Kaffirs say spirt fire. All animals, as well as man, abhor this loathsome and most shocking looking creature. To show its poisonous qualities, this fact is chronicled.

A pedlar sold a cask of native wine to three Dutch boers who lived together on a farm in the district of Clanwilliam, in old Cape Colony. Two of them died soon after drinking a cup full. The third brother returned from a hunting excursion, and on discovering the melancholy facts of their death, accused the pedlar of murdering them with poisoned wine. He declared his innocence, and to show that the wine had no agency in the death of his brothers, drank of it himself, and in a few minutes was a corpse! On opening the cask to discover the nature of the poison, one of those awful African toads was found at the bottom.

NEW YORK COLLEGE OF PHARMACY.

At a meeting of the Board of Trustees of the College of Pharmacy of the city of New York, held on the 6th of Nov., 1856, the following resolutions were adopted, and the Secretary instructed to forward a copy to the American Journal of Pharmacy for publication:

"*Resolved*, That the College of Pharmacy has received the melancholy intelligence of the death of our respected fellow member, BENJAMIN CANAVAN. We would refer to his strict moral integrity and professional ability as examples worthy of emulation. In his death the College has lost a valuable co-laborer, and society a useful citizen.

"*Resolved*, That we offer our condolence to his friends and relatives for our common bereavement."

G. W. BERRIAN, Jr., Secretary.

Editorial Department.

PATRONAGE OF PHYSICIANS AND THE APOTHECARY.—In those countries where pharmacy is regulated by law, and efficiency sustained by a sort of medical police, it is presumable that physicians have but little trouble in feeling assured that their prescriptions will be carefully dispensed. In the United States and in England, where the widest latitude exists in the practice of pharmacy, any person being legally at liberty to open a shop, the same reliance cannot be had, and hence it is natural that the physician should seek to assure himself of the quality of the medicines he prescribes. In doing this, however, there is some danger that unintentional injustice will be done to meritorious young men, who commence their business career fully intending to conduct their establishments on correct principles, by physicians getting the habit of sending their patients to stores having a wide reputation. With this qualification, we approve of the following article from the New York Medical Gazette:

"APOTHECARIES, QUACK MEDICINES, &c.

DEAR SIR,—In an article on the above subject, which you kindly published in your last issue, I promised an attempt to sustain the assertion there made, attributing inefficiency in the education of Apothecaries, both pharmaceutical and ethical, chiefly to delinquency on the part of the medical profession. Having your tacit permission, I will endeavor briefly to redeem that promise.

Firstly.—The physician enjoys the power of establishing a confidence in the meritorious Apothecary, as the community acquire but a limited knowledge on the subject of Medicine, and that, generally, under reluctant circumstances; they always defer to the judgment of the physician for any necessary information.

I would ask, how is that power often exercised, which should be influenced mainly in favor of competency and integrity?

Many physicians, from motives of delicacy or supposed policy, studiously avoid giving any preference to Apothecaries, thereby virtually recognizing no

distinction, and operating to the injustice of those who have properly qualified themselves to pursue the vocation with skill and fidelity.

I contend that physicians are as culpable in not expressing a preference, where just cause for preference exists, as in a preference for an unworthy purpose; and I would not for a moment question the acuteness of their perception, by supposing that pharmaceutical knowledge and moral integrity can long remain hidden from their observation. Surely the respected physician sufficiently enjoys the confidence of those who entrust their lives in his keeping, that he may advise them where to rely for pure medicines, without the fear of sinister motives being charged upon him. That such confidence is sometimes abused is no argument against his good intent, any more than hypocrisy is an argument against true religion; time will separate the dross from the pure gold, when the latter will appear brighter by the contrast.

As I aim to address myself to the respectable portion of the profession, whose short-comings, as connected with Apothecaries, would appear to be those of omission rather than of commission, I need hardly allude to the injurious effect produced by that portion of the profession who, if not openly, yet effectually encourage Quackery, and participate in its profits—nor to those who, in their cupidity, make arrangements with the equally culpable venders of drugs to divide the profits arising from their prescriptions, thereby offering temptations to the useless prescribing of expensive medicines by the physician, and to exorbitant charges for the same by his coadjutor.

Secondly.—If the treatment of disease requires anything beyond a mere form, medicine must possess some value, and that value is proportioned to the uniform purity of the base, and the skill exercised in its preparation; hence the physician is but consulting his own interest and the health of his patient in selecting those who possess the knowledge and integrity to prepare his prescriptions with accuracy.

An eminent writer truly remarks, that 'the love of money and the desire of promotion are two most powerful incentives to action.' The laudable desire of promotion is evinced in an effort to merit and possess the confidence of physicians, and through them of the community; and in that confidence to receive such encouragement in the duties of his profession, and such reward for his labors, as will give tangible evidence of the promotion sought for—while proving practically that knowledge and integrity are the sure stepping-stones to honorable success in his calling. In the absence of such encouragement, I fear that Apothecaries (like other mortals requiring a stronger incentive to do right, than the abstract love of it,) will degenerate into mere medicine venders, seeking a livelihood in the sale of secret preparations, which in many cases professing impossibilities, are thrust upon the public by unprincipled persons under fictitious names, whose whole object is to live without honest labor, by preying upon the credulity of others. Conclusively, then, it behoves the medical profession to regenerate the divine art, by drawing a distinct line between educated Apothecaries and mere medicine venders, and thereby stimulate the rising Apothecaries in the conviction that it is profitable as well as honorable to seek that knowledge which will enable them to appreciate the purposes of a

RETORT."

BLANCARD'S PILLS OF IODIDE OF IRON.—The Agent for this preparation has sent us a specimen of the pills, of which an advertisement will be found in the annexed sheet. Each pill is represented to contain 5 centigrammes (three-fourths of a grain) of protiodide of iron, and one centigramme (one-seventh of a grain) of metallic iron, and over this, a very thin coating of tolu, which forms a varnish impervious to the air. To be assured of the absence of free iodine, the manufacturer attaches a piece of

silver foil on the inside of the cork, which will become coated with iodide should decomposition commence. As a specimen of pharmaceutical skill these pills are deserving of commendation. When a pill is shaken in a test tube with a little water for five or ten minutes the water gives indications of iron and iodine by the appropriate tests, showing that the coating does not prevent the action of that fluid—a fact of importance in relation to their medicinal efficiency.

New Remedies: with formulæ for their preparation and administration. By ROBLEY DUNGLISON, M. D., &c. &c. *Seventh Edition, with numerous additions.* Philadelphia. Blanchard & Lea. 1856. Pp. 769, 8vo.

It is no inconsiderable evidence of the yet imperfect state of the healing art that its votaries should be constantly longing after something new—new theories in pathology—new remedies in therapeutics. However well known medicines may be able to meet the indications required, there is a certain something—a sort of charm—in the idea of arriving at the same results by an untrodden path that stimulates many medical observers to extend their researches among the numerous substances which the chemist and the botanical explorer are almost daily bringing to light. Substances which for years have been known only as rare curiosities to the chemist, suddenly, as by the wand of an enchanter, become plentiful in the market at the demand of the therapist, and plants previously known only to the traveller in some far off region are gathered and brought to us at the instigation of the same magician, by the ubiquitous arms of commerce. The study and application of these novelties enters largely into *medical progress*, and the co-operation of the pharmacist is constantly needed to aid in fitting them for the uses to which they are destined.

The work of Dr. Dunglison, embracing over 750 pages, devoted to “new remedies,” now again brought out in a seventh edition, corroborates what we have said above, by proving the necessity of catering to this want. Although intended more particularly for the practitioner as a body of information ready at hand in reference to “new remedies,” it also has uses for the pharmacist, inasmuch as the author has aimed at giving the processes of preparing and the modes of administering new substances as well as their therapeutic properties and uses. Dr. Dunglison as a compiler has the merit of giving careful references to the sources of information, which renders his book often exceedingly useful to investigators who wish to pursue the study of articles more closely than the scope of this work will admit. A work of this kind is necessarily in great measure a reprint of the previous edition, yet in looking over many articles, we find them extended and brought up to the present. Among the new items we may mention *apiol*, *caffein*, *carbazotic acid*, *cedron*, *cerium*, *cinchonin*, *hyposulphite of soda and silver*, *nickel*, *permanganate of potassa*, *quinidia*, *rennet*, and *tellurium*, as being the most prominent. So unceasing is the

suggestion of new agents, that already since the publication of this book several have been brought forward in the Journals, as valerianate of ammonia, ammonio ferric alum, and so it will continue, until their number merits another edition of the "New Remedies."

Hand-book of Inorganic Chemistry; for the use of Students. By WILLIAM GREGORY, M. D., F. R. S. E., &c. Fourth American from the Third English edition. To which is added the Physics of Chemistry, by J. MILTON SANDERS, M. D., &c. New York. A. S. Barnes & Co. 1857. Pp. 426.

Hand-book of Organic Chemistry; for the use of Students. By WILLIAM GREGORY, M. D., &c. Fourth American from the Fourth London edition. Edited by J. MILTON SANDERS, M. D., &c. New York. A. S. Barnes & Co. 1857. Pp. 480.

Four years ago we had occasion to notice the first American edition of the above works of Dr. Gregory, then published jointly under the title of "Outlines of Chemistry for Students." Since then, it would appear from the above title pages, two other editions have been published, neither of which we have met with. Being aware of the change of the name of the work from "Outlines" to "Handbook," and of the issue of the Organic and Inorganic portions in separate parts, we were not a little gratified on receiving the volumes in their new form, and promised ourselves a more deliberate examination of the Organic part than a brief glimpse of the English edition had enabled us to obtain. The result of this examination we will now present. Of the 426 pages of the inorganic chemistry, 191 pages are devoted to a compilation of the "physics of chemistry" by the American editor, who deemed the omission of any notice of *light, heat and electricity* in the English work as a defect in reference to its use as a text book here. Of this addition nearly one half is devoted to the general properties and photographic relations of light, in which the practical details of photography are entered upon with considerable minuteness. Of the remainder, one-third is devoted to heat, and two-thirds to electricity and magnetism, with a chapter on "Physiological Electricity," or its application in the cure of disease; a rather novel subject for the pages of a handbook of chemistry, although sufficiently important to the physiologist and pathologist to merit a place in works on their several branches.

It is not in reference to this preliminary matter by Dr. Sanders that we feel called upon to make exception, especially as we have not had time to examine it critically; for assuming it to be carefully compiled, it must add to the value of the work to those students who have not studied those subjects separately; but we do feel it our duty to enter a protest against the remainder of the volume as a mere reprint from the stereotype plates of the first edition, with a few changes in foot notes, and a few pages on the manufacture of aluminium (taken from the *Pharmaceutical Journal*)

in the Inorganic portion ; whilst a supplement embracing the more bulky additions to the fourth English edition of the Organic part, without any reference to them in the text, constitutes the revision of the Organic volume ! It was with surprise that we found the Editor, in view of the numerous additions and alterations made by Dr. Gregory, had lent his aid in sending out so imperfect a volume, calculated as it is to give a wrong impression of the valuable treatise of which it professes to be a reproduction, whilst in reality its text is nine years old. It is but a small matter that the leading additions are to be found in the supplement—they there stand disconnected from the text, which often contradicts them, and no marginal notes refer the reader to the discoveries and modifications of theory which may be there found. On carefully comparing the “Hand-book of Organic Chemistry” with the fourth English edition, page for page, we find so many omissions from the former that it will be impossible in the space at command to enumerate them. The more prominent, such as the view of homologous series of organic compounds, the account of the series of artificial organic bases, methyl and ethyl radicals and their amide bases and compounds with the metals of which methylamin and bismethyl are types, chloroform, the new benzole compounds, and several others, are contained in the appendix, without any notes to point the student to what part of the text they belong ; whilst a large number of important paragraphs throwing new light on subjects or modifying old opinions, are not noticed in any way by the Editor. Of such we may instance the anhydrides of the organic acids ; Dr. Playfair’s nitroprussides ; Pasteur’s observations in reference to the action of heat on the cinchona alkalies and on tartaric acid ; the relation of asparagin to malic acid as malamide, and the relations of these to succinic acid ; the later views relative to tannic acid ; Gerhardt’s views of the action of heat on kinic acid ; new observations on the carbo-hydrogen essential oils and especially on oil of turpentine ; on the oxygenated essential oils and on the sulphuretted oils ; the recent results of Anderson and Greville Williams on the artificial organic bases ; the new methylic and ethylic compounds of nicotia and conia of Kerule and Planta ; the very important and interesting discoveries relative to the cinchona alkalies, including quinidia, cinchonidia, Pasteur’s derivative alkaloids, quinicin and cinchoncin, Herapath’s iodoquinia, and the methyl and ethyl compounds of these bases, which are artificial alkaloids analogous to ammonia ; the analogous bases from morphia and codeia ; and various new facts relative to the saccharine bodies. Our space will not allow of a further enumeration of these omissions, but the above will give some idea of the shortcomings of the Editor in reference to the new matter of the fourth edition. It is a cause of deep regret that the best work on organic chemistry in the English language should in this manner be deprived of much of its value to the American student, merely to subserve the interest of the publisher in

the use of the stereotype plates of the old edition; and it is equally a source of regret that so valuable a treatise should not have fallen into hands better fitted to the task, who would have refused to edit the work under such unfavorable auspices.

We give below an extract from Dr. Gregory's Hand-book (page 413, English edition) which embraces much not noticed in Dr. Sander's edition, interesting to the pharmaceutical reader, viz:

b. Bases of Cinchona Bark.

a. Quinine. $C_{20}H_{12}N_2O_2$, or $C_{40}H_{24}N_2O_4 + n$ aq. *Syn. Chinine.* This important alkaloid is found along with cinchonine, in most species of cinchona bark. It predominates in yellow bark, *Cinchona flava*, *China regia*, or *C. calisaya*; and is obtained by boiling with an excess of milk of lime the decoction in diluted hydrochloric acid of the bark, and treating the precipitate with hot alcohol, which dissolves cinchonine and quinine. On evaporation, the cinchonine is deposited in crystals and the quinine remains dissolved. Water is added, which causes the quinine to separate as a resinous mass. It may be obtained in crystals as a hydrate with 6 aq. There is another crystalline hydrate with 2 aq., by the spontaneous evaporation of its solution in absolute alcohol. It is very sparingly soluble in water, but very soluble in alcohol and in acids. Its solutions are very bitter. When heated with hydrate of potash, it yields carbonate of potash, hydrogen gas, and *quinoline* or *leucoline* (see p. 440 *et seq.*)

Quinine is decidedly alkaline, and neutralises the acids. Its salts, especially the sulphate, are very much used in medicine, especially as febrifuge and tonic remedies, in most cases very superior to the bark in substance. The sulphate of quinine used in medicine is $2(C_{40}H_{24}N_2O_4)$, $2S O_3$, $2H O + 14$ aq. The acid sulphate, $C_{40}H_{24}N_2O_4$, $2S O_3$, $2H O + 14$ aq., is much more soluble in water; hence, in draughts, sulphate of quinine is generally dissolved in diluted sulphuric acid. The hydrochlorate, phosphate, citrate, and ferrocyanate of quinine have also been employed in medicine.

Methyloquinium, $C_{40} \begin{matrix} H_{24} \\ C_2 H_3 \end{matrix} \} N_2 O_4$. This compound, homologous with ammonium, is obtained as iodide, when iodide of methyle acts on quinine. From the iodide, by the usual means of oxide of silver, the hydrated oxide is obtained, which is probably a strong base, but has not been fully described.

Ethylquinium, $C_{40} \begin{matrix} H_{24} \\ C_4 H_5 \end{matrix} \} N_2 O_4$ is formed when iodide of ethyle acts on quinine. The hydrated oxide, prepared from the iodide by oxide of silver, is an energetic base, which attracts carbonic acid from the air. The preceding base is said to resemble it, which is no doubt true.

We may here mention the remarkable salt discovered by Mr. Herapath, which is formed when bisulphate of quinine is dissolved in strong acetic acid, warming the solution, and an alcoholic solution of iodine added drop by drop. The mixture being allowed to stand in a quiet place, deposits large hexagonal plates, which by reflected light are emerald green, with metallic lustre like the elytra of the golden beetle. By transmitted light, they have only a faint olive color. If two of these plates be superposed, so that their larger diameters are at right angles, no light passes through, even when the crystals are no thicker than the five-hundredth of an inch. This is exactly what happens with two tourmalines of which the axes are crossed. If polarised light be used, it passes through, giving to the uncovered part of each plate, complementary colors, such as green and rose-color, while the double or covered part appears of a deep chocolate brown. Hence these crystals may be used as polarisers and depolarisers, and they have the advantage of allowing far more light to pass through than tourmalines.

The composition of this salt is $C_{40}H_{24}N_2O_4, I_2, 2S O_3, 2H O + 10 aq.$, and it may be considered as the bisulphate of *iodoquinine*, a base composed of quinine + 2 eqs. of iodine. Indeed such a compound is formed when iodine is triturated with quinine, as an amorphous brown mass, very similar to *iodocinchonine*.

b. Quinidine, $C_{40}H_{24}N_2O_4 + 4 aq.$ This base, isomeric with quinine, is obtained from what is called in commerce *quinoidine*, which is an amorphous basic substance, found in the mother liquors of quinine. This is a mixture of quinine and quinidine. The latter is much less soluble in ether than quinine, and crystallises when pure with great facility, in large rhombic prisms, which effloresce in the air. It differs from quinine also, in its action on polarised light, for quinine causes deviation to the left, quinidine to the right. The neutral sulphate of quinidine is like that of quinine, and may be used for the same purposes.

c. Quinicine, $C_{40}H_{24}N_2O_4$. This base, also isomeric with dry quinine, is formed when the salts of quinine or of quinidine are heated for some time to about $248^\circ F.$ It is bitter and febrifuge, insoluble in water, very soluble in alcohol, and causes deviation of the plane of polarisation to the right. It does not appear to crystallise.

d. Cinchonine, $C_{40}H_{24}N_2O_2$. This base predominates in the grey bark *Cinchona condaminea*, or *C. rubiginosa*, and is also found in large quantity, as well as quinine, in red bark, *C. oblongifolia*. Its preparation has been above described. It crystallises very readily, and is not so bitter as quinine, although highly febrifuge. When heated, a considerable part is sublimed. When distilled with potash, it yields quinoline. It neutralises the acids, forming crystallisable salts, which may be substituted for those of quinine.

It is very important to observe that cinchonine only differs from quinine by 2 eq. oxygen; and although hitherto no one has succeeded in converting one into the other, little doubt can be entertained that this will be accomplished in process of time. The fact that both yield quinoline is very interesting. Cinchonine yields with chlorine and bromine substitution-bases, *chlorocinchonine* and *bromocinchonine*, &c., in which 1 eq. of hydrogen is replaced by chlorine or bromine.

Quinine and Cinchonine may be distinguished in solution by adding first chlorine water, so as to make the liquid yellow, and then a little ammonia, which strikes a green color with quinine, but not with cinchonine. If too much ammonia have not been added, the green color changes to violet on the addition of a little more chlorine.

e. Cinchonidine, $C_{40}H_{24}N_2O_2$. This base, isomeric with cinchonine, occurs in a bark resembling the Huamalies cinchona bark, also in the Cinchona bark of Maracaibo, and in that called of Bogota. It is extracted by the same process. It forms hard, brilliant, rhomboidal prisms, striated on the faces. They are soluble in alcohol, very sparingly soluble in water or ether. Both this base and cinchonine cause the plane of polarisation to deviate to the right.

f. Cinchonine, $C_{40}H_{24}N_2O_2$. This base, isomeric with the two preceding, is formed by the action of heat on the sulphate of cinchonine. It is insoluble in water, soluble in alcohol and amorphous, bitter and febrifuge, causing deviation of the plane of polarisation to the right.

Bichlorocinchonine, $C_{40} \begin{smallmatrix} H_{22} \\ Cl_2 \end{smallmatrix} \} N_2 O_2$. This base in which chlorine replaces

2 eqs. of hydrogen in cinchonine, is formed when chlorine is passed through a solution of the acid hydrochlorate of cinchonine. It is precipitated by ammonia, and crystallises from alcohol in minute prisms. It forms salts with acids.

Bromocinchonine, $C_{40} \begin{smallmatrix} H_{23} \\ Br \end{smallmatrix} \} N_2 O_2$, is formed by the action of bromine on the

acid hydrochlorate of cinchonine. It forms scaly crystals and produces salts with some acids.

Sesquibromocinchonine, $C_{40} H_{\frac{45}{2}} Br_{\frac{3}{2}} N_2 O_2$, is formed along with the preceding base. It may be obtained in slender acicular crystals, and has a feeble bitter taste, but is alkaline. Its salts crystallise readily. The formula appears strange, but it is intended to show that the 24 eqs. of hydrogen in cinchonine are here made up in the proportion of $22\frac{1}{2}$ to $1\frac{1}{2}$ of hydrogen and bromine. $H_{\frac{45}{2}} = H22\frac{1}{2}$ and $Br_{\frac{3}{2}} = Br 1\frac{1}{2}$; the latter expressions, however, are never used, as being inconsistent with the very notion of atoms. It is not easy; however, to see how the fractions $\frac{45}{2}$ and $\frac{3}{2}$ are less inconsistent with that notion. The fact is, that equivalents are probably never single atoms, but groups, and such groups may be supposed to be divided, which atoms cannot be.

Bibromocinchonine, $C_{40} \left. \begin{matrix} H_{22} \\ Br_2 \end{matrix} \right\} N_2 O_2$ is formed like the two preceding, using an excess of bromine. It is separated by ammonia, and forms pearly needles, and sometimes octohedral crystals, the latter being a hydrate with 4 aq. It is also basic.

Iodocinchonine, $2 (C_{40} H_{24} N_2 O_2) + I_2$, is not a substitution-product like the preceding four bases, but is cinchonine *plus* iodine. It is formed when the two are triturated together. Alcohol dissolves the mass, and by spontaneous evaporation deposits, first, saffron-colored tubular crystals of iodocinchonine, and then hydriodate of cinchonine. The former is insoluble in barley-water, which dissolves the latter. It is slightly bitter, soluble in alcohol and ether.

Methylocinchonium, $C_{40} \left. \begin{matrix} H_{24} \\ C_2 H_3 \end{matrix} \right\} N_2 O_2$, is obtained as iodide when iodide of methyle acts on cinchonine. Treated with oxide of silver, this salt yields the hydrated oxide, which is a strong base, soluble in water, homologous with hydrated oxide of tetramethylum. Its salts are very soluble and do not readily crystallise.

Methylocinchonidium. This is the radical of another strong base isomeric with the preceding, and its iodide and hydrated oxide are obtained in the same way, from cinchonidine, and resemble those of methylocinchonium.

Quinine, cinchonine, quinidine, cinchonidine, quinicine, and cinchonidine, all, when heated with potash, yield quinoline, a volatile oily base, already alluded to.

g. Aricine, $C_{46} H_{26} N_2 O_8$. This base was found in 1828, in a cinchona bark from Arica, in Peru, and has not since occurred. It is very similar to cinchonine, from which it differs in being soluble in ether. Aricine forms prismatic crystals larger than those of cinchonine. It is sparingly soluble in water, very soluble in alcohol, soluble in ether. It has a bitter taste. Nitric acid dissolves it with an intense green color, but decomposes it. Its salts are very soluble, and crystallise readily. The neutral sulphate, however, forms, when its hot solution is cooled, a gelatinous mass.

The mechanical execution of the volumes is creditable, and the general style of the "getting up" is good. The works may be had of H. Cowperthwait & Co. of this city.

Proceedings of the American Pharmaceutical Association, at the Fifth Annual Meeting, held in Baltimore, September, 1856; with a List of Members. Philadelphia. Pp. 91.

Since our last issue the Executive Committee of the Association have published the proceedings of the late meeting, and have, we presume, distributed the work to members by mail. As this work embraces a number of interesting papers, (several of which have been transferred to our pages)

and is double the usual size, we look upon it as an indication of a decided step in advance by the Association, and an earnest of what may be expected when a more general interest is taken in its success by pharmacutists in all parts of the Union. We do not know what arrangement the Executive Committee have made for the distribution of the work to those not members, since its publication has become such a heavy item in the expenditures of the Association, but would suggest to those who feel an interest in its progress, to mail half a dozen letter stamps to Edward Parrish, chairman of the Executive Committee, 8th and Arch streets, Philadelphia, with the request to have the pamphlet sent by post. In this way, at a very small inconvenience and expense, much aid can be extended.

Chemical and Pharmaceutical Manipulations ; a Manual of the Mechanical and Chemico-Mechanical operations of the Laboratory, for the use of Chemists, Druggists, Manufacturers, Teachers and Students. Second and enlarged edition. By CAMPBELL MORFIT, Prof. of Analytic and Applied Chemistry in the University of Maryland, and CLARENCE MORFIT, of the U. S. Assay Office. With 537 illustrations. Philadelphia: Lindsay & Blakiston, 1857. Pp. 629, octavo.

It is with satisfaction that we have glanced over Prof. Morfit's new edition, and compared it with the previous one of 1849. We have been in the habit of recommending this work, as calculated to be really useful to pharmacutists who aim at qualifying themselves in the details of chemical manipulation. It is clearly written, well illustrated with drawings, and practical in its character. This edition is much enlarged, and bears the impress of a careful revision. In point of mechanical execution the volume is highly creditable to the publishers, both as regards the paper, press work and binding. We would offer some extracts from the new matter, had we not already at page 17 given space to a notice of the same work by a contributor, to which our readers are referred.

Transactions of the New Hampshire Medical Society, (sixty-sixth Anniversary, held at Concord, June 3rd and 4th, 1856. Concord, N. H., 1856. Pp. 76.

This pamphlet embraces several papers, among which are reports on Quackery, and on the indigenous Botany and Materia Medica, by Albert Smith, M. D., of Petersborough, N. H. We may have occasion to again refer to these, but at present our space is exhausted.

CATALOGUE OF THE CLASS OF THE PHILADELPHIA COLLEGE OF PHARMACY,

FOR THE THIRTY-SIXTH SESSION, 1856—7.

With a List of their Preceptors and Localities.

Matriculants.	Town or County.	State.	Preceptors.
Allen, Harvey	Liberty,	Virginia,	Bullock & Crenshaw,
Alspach, Michael	Philadelphia,	Pennsylvania.	A. Wiltberger & Bro.,
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Bucher, Henry F.	Carlisle,	"	Caleb R. Keeney,
Bunn, Jonathan H.	Trenton,	New Jersey.	Wm. F. Patterson,
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De Choudens, J. F.	Corsica,	France.	
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Lancaster, Thomas	Frankford,	"	Wm. Hodgson, Jr.,
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McDermott, Charles	Philadelphia,	"	John Gegan,
McMullen, Jacob B.	"	"	Wm. M. Bowen,
Massenburg, T. L.	Hampton,	Virginia.	O. R. Livermore,
Mattison, Asa	Galesburg,	Illinois.	
Mercein, James R.	Easton,	Pennsylvania.	
Merced, John T.	St. Clairsville,	Ohio.	Dallam, Baker & Co.,
Moorhead, C. Noble	Delaware Co.,	Pennsylvania.	George C. Bower,
Morand, Alfred L. S.		France.	J. H. Palethorp, Jr.,
Nathans, Horace A.	Philadelphia,	Pennsylvania.	Henry Mullen,
Neal, Leander	"	"	Samuel Simes,
Noble, Thomas	"	"	James Bond, M. D.,
Nolen, Albert V.	Boston,	Massachusetts.	John C. Baker & Co.,
Pile, Wilson H., Jr.	Philadelphia,	Pennsylvania.	Wilson H. Pile, M. D.,
Pleis, John M., Jr.	"	"	John Horn,
Richards, George K.	"	"	Robert C. Davis,
Richardson, Joseph G.	"	"	Charles Ellis & Co.,
Rohrbacher, Fred'k	"	"	
Rommel, Jacob M.	"	"	George A. Miller,
Schmidt, Lewis F.	Allentown,	"	Geo. M. Snowden,
Schurk, Peter		Iowa.	
Seiler, Robert H.	Harrisburg,	Pennsylvania.	Ziegler & Smith,
Seuret, J. Pedro	Cienfuegos,	Cuba.	Wm. Thompson,
Sherman, Oliver G.	Richmond,	Virginia.	B. J. Crew,
Shoemaker, Joseph L.	Philadelphia,	Pennsylvania.	John Bley,
Shoemaker, Wm. M.	"	"	R. Shoemaker & Co.,
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Smith, Valentine H.	Montgomery Co.	"	J. H. Smith,
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Templeton, J. W.	St. Clairsville,	Ohio.	W. W. & H. Smith,
Tourtelot, Fred'k J.	Philadelphia,	Pennsylvania.	Durand & Tourtelot,
Warner, Wm. H.	Haddonfield,	New Jersey.	Dr. J. T. Williams,
Weaver, J. Thornton	Philadelphia,	Pennsylvania.	Henry A. Bower,
Weatherly, Wm. H.	Freehold,	New Jersey.	James T. Shinn,
Weiser, Thomas D.	York,	Pennsylvania.	Edward R. Evans,
Wetherill, J. B.	Philadelphia,	"	Thomas P. James,
Wilson, P. Butler	Darien,	Georgia.	J. Henry Abbott,
Young, Joseph	Philadelphia,	Pennsylvania.	
Zeitler, Edward	"	"	Charles Ellis & Co.,
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THE
AMERICAN JOURNAL OF PHARMACY.

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MARCH, 1857.  
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EXTRACTUM COLOCYNTHIDIS COMPOSITUM.

By EDWARD R. SQUIBB, M. D., U. S. Navy.

Assistant Director Naval Laboratory.

“Take of Colocynth, deprived of seeds and sliced, six ounces.
Aloes in powder, - - - twelve ounces.
Scammony in powder, - - - four ounces.
Cardamom seed in powder, - one ounce.
Soap, - - - - - three ounces.
Diluted alcohol, - - - one gallon.

Macerate the colocynth in the diluted alcohol, with a gentle heat, for four days. Express and filter the liquor, and add to it the aloes, scammony and soap; then evaporate to the proper consistence, and, near the end of the process, mix the cardamom with the other ingredients.”—U. S. PHARM.

Judging from the inefficiency of this important preparation, as it is frequently found, there are some points in its manufacture that do not meet with the requisite attention on the part of those who make and use it.

In the first place, apart from the quality of the other materials, there are two chief elements of uncertainty in the preparation, namely, the state of maturity and dryness of the colocynth used, and the amount of water in the soap. Colocynth not well matured, with white flattened seed that float in the menstruum, yields less extract; and soap, as usually found, varies in the amount of moisture from 10 to 19 per cent. In the second place, it is almost impossible, and quite impracticable, to separate all the seed from the colocynth as usually met with in the market;

because so many of the apples are immature or blighted that the seed in drying shrivel up to mere scales, and become impacted in the pulp, or broken up with it so as to escape ordinary precaution in the separation. The proportion of perfectly matured apples, with clean, deep olive grey heavy seed, does not amount to more than one-half, whilst those apples in which a portion of the seed is not easily separable, amount to about 5 to 8 per cent. in the best specimens of the commercial drug.

The best way to overcome these practical difficulties is, to establish experimentally a ratio for the pulp and seed by the amount of dry extract yielded, and the amount required by the formula, and then operate with seed and pulp together. This ratio needs to be corrected or newly obtained each time of making the extract, because in keeping, the seeds continue to lose weight long after the pulp becomes dry. Thus, entire apples, of the various sizes, selected with care, after having been kept three years in a dry store-room, yield 34 per cent. of pulp. Whilst a similar assortment of entire apples from the various parts of a recently purchased case yield 25.8 per cent of pulp. The pulp from such perfect apples, well exhausted, yield 60.7 to 60.8 per cent. of dry extract; whilst of the same selections, taken pulp and seed together, and treated in the same manner, the yield will vary widely according to the state of dryness, from 15.69 per cent. in the recent purchase, to 20.6 per cent. in that long kept.

The yield of extract from a careful average of the above mentioned newly purchased case, taken seed and pulp together, on the large scale, is only 14.112 per cent., whilst that from whole apples, seed and pulp together, is 15.69 per cent., showing that the average yield of pulp in a case is not that of the entire apples, but below it; that is to say, not 25.8 per cent. but 23.227 per cent. of the whole weight. Hence the mercantile assertion that broken colocynth is better than whole, because the seed being heavier and more mobile shake out and are lost in larger proportion, is not supported by fact, since whole apples yield nearly 1.6 per cent. more of extract than broken and whole together.

The writer has not been able to find a statement of the proper composition of this extract, and therefore has prepared the following, which is strictly that of the U. S. P., except that the

prescribed proportion of pulp is more fully exhausted than by the prescribed management.

Extract of colocynth, dry,	15.7 per cent.	14.48 per cent.
Aloes, - - -	51.7 "	47.68 "
Scammony, - - -	17.2 "	15.86 "
Cardamom, - - -	4.3 "	3.98 "
Soap, dry, - - -	11.1 "	10.24 "
	-----	Water, 7.76 "

Dry comp. extract,	100.0	-----
Compound extract, pill mass consistence,		100.00

The formula and process arrived at by the writer as perhaps accomplishing the intention of the U. S. P., and as certainly yielding an excellent preparation, is as follows, the quantities being sixteen times those of the officinal formula.

Of colocynth, pulp and seed together, 28lbs. 5 oz. av., equivalent to 96 $\frac{2}{3}$ troy of pulp.

This should yield of dry extract 4lb av. = 58 $\frac{2}{3}$ 2 $\frac{1}{2}$ 3 troy.

Aloes in powder, 13lbs 2 $\frac{1}{2}$ oz. = 192 $\frac{2}{3}$

Scammony in powder, 4lbs 6 $\frac{1}{4}$ oz. 64

Cardamom 1lb 9 oz. in husks,

Yielding of powdered seed, 1lb 1 $\frac{1}{4}$ oz. = 16 $\frac{2}{3}$

Soap, (containing about 14 per

cent. water,) 3lbs 4 $\frac{1}{2}$ oz. = 48 $\frac{2}{3}$

Yielding when dried and powd. 2lbs 13 $\frac{1}{4}$ oz. = 41 $\frac{1}{4}$ 3

Alcohol, 1 pint.

Diluted alcohol, 16 gals.

The colocynth, broken up with the hands, is macerated with 9 gallons of the Diluted alcohol for four days, at a gentle heat, with occasional stirring, in a vessel of 15 gallons capacity. The liquor* is then expressed and filtered through flannel into a vessel of 16 gallons capacity. The press cake or residue is then broken up and packed for percolation in a 10 gallon jar, around a glass tube. This glass tube is of an inch or more internal diameter, and of the length of the inside of the jar. Its lower end is made irregular and tied under with a piece of coarse

* This tincture yields 11.052 per cent. of dry extract, and therefore appears to indicate that the once expressing directed in the officinal process, (even though a much larger proportion of menstruum is used there,) is not sufficient to exhaust the material properly.

flannel, and the tube is then set upright in the centre of the jar so as to form a well for the percolate. Thus disposed three gallons of the Diluted alcohol is poured upon this residue, the jar covered, and allowed to stand in a warm place two or three days. It is then percolated with the remainder of the Diluted alcohol, the percolate being drawn from the central well by means of a very small India rubber tube syphon. The liquor is then finally expressed, and with the percolate strained into the receiving vessel* with the first portion, the whole well stirred together and allowed to stand two days. The clear tincture is then drawn off with a syphon, and carefully measured into a still, leaving the muddy portion, amounting to about 4 pints, in the vessel. This muddy portion is collected and boiled with the pint of Alcohol, cooled, and strained through flannel. If the attempt is made to filter this without some such treatment as this boiling with alcohol, a very imperfect result will be obtained, and much time lost, for the tincture will evaporate faster than it will pass the clogged filter. Even by this method about 3 hours is required to get off the clear tincture. The whole tincture having been carefully measured, one fourteenth part is separated, and evaporated to dryness in a tared basin. The weight of this dry extract multiplied by fourteen gives the weight of the whole yield. If the yield thus indicated be over four pounds avoirdupois, as will commonly be the case, the surplus is taken from this dry extract and put aside for a future operation. The remainder, or amount necessary to make the proper proportion in the compound extract, is added with the aloes.

About 8 gallons of dilute alcohol is then recovered from the tincture by means of a water or steam bath, and this is reserved for a future process. The residuary liquor in the still is then transferred to a tared evaporating basin and evaporated over a steam jet to the consistence of honey. The powdered aloes is then added and the mixture stirred till the heat has melted the aloes. The soap, previously dried and powdered, is next added and thoroughly incorporated. Then the scammony,—and finally the cardamom powder is added, and the whole stirred well for

* This second tincture yields on evaporation 3.06 per cent. of dry extract, similar in all its sensible properties to that from the first tincture.

about half an hour, and weighed. If the contents of the basin weigh more than $27\frac{1}{2}$ lbs. av., the evaporation and stirring are resumed till that weight is attained.

This preparation, when quite cold, is of a good consistence for pills, is of a dark olive brown color,—not black,—and has a fine aromatic odor.

To adapt it to more general use, and for convenience of dispensing, it is the practice of this laboratory to dry the extract further, or until it can be rubbed up to a coarse powder, and served in bottles. The further drying is effected by spreading it upon the large glass plates of the drying room for about 3 days, when it is found to weigh about $25\frac{1}{2}$ lbs. av., or very nearly the sum of the weights of the dry materials.

In this process, although the long heating and stirring rendered necessary by the U. S. P. direction to add the powders at the beginning of the evaporation is avoided, yet the aroma of the aloes is driven off in so great a degree as to pervade the house clothing, &c., for some days,—while the process is still laborious and troublesome, involving much skill and good management in securing a good aromatic preparation.

When made from good Bonair gourd aloes, and scammony containing 60 to 67 per cent. of resin, this preparation costs about three dollars per pound, exclusive of the labor and skill of manufacturing, or, say three dollars and a half as the lowest entire net cost of manufacture on a scale of 25 lbs,—and yet it is confidently believed that some hundreds of pounds have been supplied to the New York market during last year at prices varying from seventy-five cents to one dollar per pound,—and that the preparation sells the better, and the more largely, as the price is lower.

In view of these circumstances, and for other reasons, the writer proposes another method for this formula, by which the same ratio of materials are combined, and an extract of full aromatic and purgative value is very easily and expeditiously prepared, in a form applicable to all uses, and constant in its composition, when the intent is good.

This is simply that the materials be mixed in the dry state, and powdered and sifted together. The soap, an important corrigent and adjuvant to the aloes and scammony, is very easily

dried and powdered ; and, like the cardamom, is more easily and efficiently powdered in association with the other materials. The admixture also facilitates the pulverization of the aloes, by rendering it less liable to gum or clog.

Such an extract has been prepared, and is now being tested in practice, with a view to its substitution for use in the Navy. The formula used is as follows :

Extract of colocynth dry	.	.	.	.	10½3
Aloes	.	.	.	.	34½3
Scammony	.	.	.	.	11½3
Cardamom	.	.	.	.	3 3
Soap, dried at 212°	.	.	.	.	7½3

The ingredients are mixed together thoroughly, and then powdered and sifted through bolting cloth of 110 threads to the linear inch. Portions of the cardamom seeds and the ligneous impurities of the aloes and scammony pass through the sieve last. Therefore a second mixing and sifting is required to ensure equability in the resulting powder.

A very small proportion of water,—7 to 8 per cent.—makes this powder at once into the consistence for pills.

It would be an improvement upon this, and all formulæ for this preparation if resin of scammony could be substituted for the drug, since the drug varies as much, even under the present law for inspection, as from 55 to 80 per cent. in medicinal value.

U. S. NAVAL LABORATORY, New York, Jan., 1857.

ON AQUEOUS FLUID EXTRACT OF SENNA.

WILLIAM PROCTER, JR.

Dear Sir:—Having been extensively engaged in manufacturing Fluid Extract of Senna during the past few years, my experience has led me to adopt a method differing from that prescribed in the Dispensatory. Its advantages consist in this, that the resulting extract is a handsomer preparation, less liable to fermentation, affords a clear mixture with syrup and infusion, and, above all, free from griping property. It has

been extensively used, and I think its value is proved. I send the formula for publication, if you think it of sufficient value.

Take of Senna, bruised	2½ lbs.
Sugar	3vj.
Ol. Fennel	
Ol. Carui	aa gtt. xv.
Alcohol	3vj.

Macerate the senna in cold water. Transfer to a percolater and displace with the same so long as the infusion shows strength. In warm weather place ice on the percolator. Add the sugar and evaporate to 26 ounces. Then add the alcohol holding the oils in solution. Mix well, allow the precipitate to subside, and decant the clear liquid for use.

Fluid Extract of Senna as thus prepared, is a more fluid preparation than the officinal extract, is not unpleasant to the taste, is quite active in a dose of one to three teaspoonfuls, and operates with little or no pain to the patient.

Very truly your ob't serv't,

HENRY THAYER, M. D.

Cambridge, Mass., Jan. 28, 1857.

NOTE ON BARKS.

BY EDWARD PARRISH.

Melambo or Matias Bark.

In confirmation of the conclusions of E. S. Wayne, in his paper in the last number of this journal, I may state that I have recently enjoyed an opportunity of comparing specimens of the bark such as I presented to him, and which he has so thoroughly examined, with samples in the cabinet in the University of Pennsylvania, known as Melambo Bark. These have been in the Cabinets of Drs. Wood and Carson for years, and correspond precisely with the bark alluded to. This bark has been, for a year or two past, quite abundant. It was invoiced to the importers as Matias bark; and large quantities have been sold to spice grinders for the purpose of adulteration, and to the trade generally, as Winter's bark. It is one of the most delightful aromatics I have ever met with, and apart from any febrifuge properties, is rendered valuable by its stimulating and agreeable aroma.

Soap Bark.

The *Quillaia Saponaria*, or Soap Bark, has been occasionally imported into this country for twenty-five years past. Dr. Ruschenberger mentions having become acquainted with it in Chili in 1827, when it was reputed to be highly medicinal, though chiefly used for its soap-like qualities in cleansing cloth from stains and grease, and as a hair-wash.

In vol. xii, p. 209, of this Journal, a chemical analysis of this bark by MM. Henry, Jr. and Boutron Charland, is published. This shows it to contain *Saponin*, which is its most characteristic principle, and no tannic acid or bitter principle.

Although not very generally known, *Quillaia* has considerable reputation, and would be still more popular if always obtainable. Having occasion to procure some a few months since, I applied to several drug houses without success, till at last I met with some, as I supposed; and having procured a quantity, without much examination, added it to a preparation I was making, to which, I soon discovered, it imparted an intensely bitter taste. After detecting the sophistication in this way. I proceeded to examine the bark, and found it to differ from Soap Bark, and though apparently a quassia, to be different from any *Simaruba* at hand. It has sufficient interest to demand further investigation.

Quassia Bark?

Is quite cheap, and I suspect is obtainable in large quantities. It comes in flat pieces, sometimes two feet in length, six inches in width, and a quarter of an inch in thickness, and apparently from the trunk of a very large tree. Externally it has a layer of thin, rough, dark grey epidermis not easily separable; internally it is nearly white, very soft and glossy; its texture is fibrous, though not as distinctly so as in the case of the *Simaruba* bark I have heretofore seen. Its taste is intensely bitter, without astringency or acidity. It has no odor. The existence of a distinct, easily separated, dark colored outer bark, and less fibrous and stringy structure, serve to distinguish this from *Simaruba*, which is from the root, while this is evidently from the trunk. May not this be the bark of the *Quassia Excelsa*?

Its substitution for *Soap bark* may instantly be detected by

the taste ; nor do they resemble each other very closely if compared. Soap bark is more fibrous ; the inner surface is seldom so white, it has, in fact, when old, a decided brownish tinge ; the outer bark is much thicker and rougher and has a reddish brown color, not grey. Another remarkable characteristic of Soap bark is the appearance of minute, glistening crystals, which cover the whole fibrous structure, and are seen when it is fractured. Its acrid taste, and the frothing of its infusion, are highly characteristic.

NOTE ON COLLODION.

By WILLIAM PROCTER, JR.

Notwithstanding so much has been written on the subject of collodion, and it has become an officinal preparation, many continue to find difficulty in obtaining a gun cotton that will dissolve readily and produce each time a uniform preparation of equable consistency. Usually the Pharmacopœia process, strictly followed, affords a cotton of which the greater part is taken up by alcoholic ether, leaving an undissolved residue which needs to be strained out. Sometimes it happens that the cotton loses its fibrous texture and coalesces into a gummy mass, appearing like tragacanth mucilage, which does not properly dissolve. Again it will be like quince mucilage in consistence, whilst frequently a perfect solution is obtained. The action of nitric acid on cotton is now well understood to be the substitution of nitrous acid for hydrogen, or perhaps nitric acid for water in the formula of cotton. Soluble cotton is considered to be less nitricised than the true gun-cotton, the formula of which, according to Porret and Teschemacher (Gregory's Chemistry, fourth edition), is $C^{12} H^8 O^8 + 4NO^5$ or $C^{12} H^8 O^{12} 4NO^4$. According to this formula two equivalents of water are replaced by two eq. of NO^5 , and then two other eqs. of NO^5 are taken into the composition of the gun-cotton : so that the anhydrous cotton is to the nitric acid as 144 to 216. Other chemists have given the formula for gun-cotton with a less proportion of nitric or of nitrous acid. The soluble cotton has been stated to contain 3 equivalents of NO^5 to 2 equivalents of anhydrous cotton $C^{24} H^{17} O^{17}, 3NO^4$ (Gladston in Pharm. Jour. xi., 481). Be this as it may,

it is quite evident that the physical property of the resulting compound, as regards solubility in alcoholic ether, is exceedingly variable and it would be interesting to know whether these degrees of solubility are parallel with the proportion of NO^5 absorbed into the constitution of the cotton. When fully nitricised, 100 parts became 169.5 parts of gun-cotton fit for blasting. In my experience with the Pharmacopœia process 100 parts became usually 125 parts. Last autumn, when illustrating this subject to the class, cotton was immersed in equal parts of commercial sulphuric acid and red fuming nitric acid sp. gr. 1.45 and then set aside until the next lecture, an interval of four days elapsing, when it was removed, washed, pressed, washed in alcohol, again pressed, and was found to be completely soluble in alcoholic ether without residue. Since then I have repeatedly tried the process with the long maceration and have uniformly succeeded in obtaining a soluble cotton, and now offer the following formula based on this experience.

Take of Fuming nitric acid, (sp. gr. 1.42 to 1.45)

Sulphuric acid, of each	four fluid ounces.
Cotton, free from impurities	half an ounce.
Commercial ether	two and a half pints.
Alcohol and water, of each	a sufficient quantity.

Mix the acids in a suitable vessel capable of being covered; introduce the cotton, and after pressing it into the acid until perfectly immersed and saturated, allow it to stand four days. The cotton should then be removed, the excess of acid pressed out, and then thoroughly washed till it is neutral to litmus paper. It should now be strongly pressed between bibulous paper, then immersed in strong alcohol to abstract the adherent water, and again pressed, when it may, without further drying, be put in the ether and dissolved. The use of alcohol for drying gun-cotton is an improvement attributed to the late W. W. D. Livermore of Philadelphia.

The collodion by this process is less mucilaginous than that obtained by the U. S. P. formula, but it is very adhesive and dries rapidly. There is no necessity of teasing the cotton about in the acid mixture with glass rods, when so much time is afforded for the maceration, and hence the fibres of the cotton are less interwoven and can be separated readily when picked out previous to drying, when it is desired to get it in that state.

ON SOLUTION OF SULPHITE OF SODA.

PROF. PROCTER :—

About a month since I received the following prescription, the second I had seen of the kind, and which I think has frequently been presented at the counters of pharmacutists in this city :—

Solut. Sulphite of Soda \bar{z} vj.

S. J.

Take two teaspoonfuls for a dose.

Knowing of no formula for such a preparation, I applied in vain to several apothecaries, and to the physician himself, to know what proportion of the salt indicated was to be dissolved in a given quantity of water.

Finding that the secret was possessed by one pharmacist only, I was compelled to purchase the solution of him, and having taken the trouble to ascertain its composition, I thought it well to communicate the result in this way ; so that if deemed best it may be made public through the columns of the Journal, for the benefit of those who, like myself, have been at loss about it.

One fluid ounce of the solution being evaporated nearly to dryness, solidified into a crystalline mass which weighed 30 grains. On examination the salt possessed the properties of hyposulphite of soda ; it was odorless, of a mild saline, “ hepatic ” taste. Heated in a test tube it fused and then decomposed, giving off sulphur, which was sublimed into the upper part of the tube. The solution was neutral to test paper. The hyposulphite is slightly alkaline unless an excess of acid is present. Nitrate of silver caused a white precipitate soluble in excess of the hyposulphite. This precipitate gradually acquired a brown, and afterwards a black color, owing to the formation of sulphuret of silver. Freshly precipitated chloride of silver was also entirely soluble in the solution.

This salt is much used in the Dageurreotype art to wash off the superfluous iodine from the plate. Many years ago it was highly recommended as an antiherpetic, and used as a remedy in exanthematous affections, painful affections of the skin, slight congestions of the viscera, scrofula, lymphatic diseases, &c. A formula for a syrup of the hyposulphite containing one part of the salt in 30, was published in the Journal, Vol. xvii.

PHARMACEUTICAL NOTICES.

By THE EDITOR.

From time to time, in the experience of a regular pharmaceutical establishment furnished to meet the ordinary demands of the medical profession, there are substances or preparations called for which are not in store, and have either to be procured or made. It is well when the pharmacist can fabricate them from his stock, and he often may, by practical familiarity with the principles involved in pharmaceutical manufacturing. For instance a fluid extract of a substance is prescribed, of which a solid extract is in the store. By knowing the relation which this extract bears to the substance yielding it, the apothecary may convert such extract into fluid extract by the proper menstruum and preservative agent. We give below formulæ for several preparations, which have been recently prescribed in this city.

Extractum Jalapæ Fluidum.

In making a formula for this preparation it is necessary to use a menstruum that will dissolve the resin upon which its activity is to depend, and the liquid which is to remain in the preparation, should possess the same solvent powers. Moreover, in reference to strength, it is best to take that of the fluid extract of rhubarb and of senna as the type—ounce to the fluid ounce. Hence it must be at least partially an alcoholic fluid extract, and not a saccharine one, as in the case of rhubarb. The following is the formulæ; viz:—

Take of Jalap, of good quality, sixteen ounces (Troy.)

Sugar eight ounces.

Carbonate of Potassa half an ounce.

Alcohol,

Water, of each a sufficient quantity.

Reduce the Jalap to coarse powder, pour on it one pint of a mixture of two parts of alcohol and one water, and allow it to stand twenty-four hours. Then introduce it into a percolator and pour ordinary diluted alcohol slowly on until half a gallon of liquid has passed. Evaporate this in a water bath, or still, till reduced to one half, then add the sugar and carbonate of

potassa, and evaporate till reduced to twelve fluid ounces. Put the liquid thus obtained, which yet warm, in a pint bottle, and add four fluid ounces of alcohol, and mix by agitation.

The alkali forms a resinous soap with the jalap resin, greatly increasing its solubility in water, and at the same time renders the preparation less griping. (See Durand in vol. iii. page 87 of this Journal, 1831.)

The object of the sugar is also to aid in the retention of the resinous matter in a fluid condition, as well as to mask the taste of the Jalap. The dose will vary from fifteen minims to a fluid drachm according to the effect desired. By means of this preparation the physician may prescribe Jalap in mixtures with great facility, and avoid the large proportion of alcohol unavoidable when he resorts to the officinal tincture.

Tinctura Ignatiæ Amaræ.

Since the extract of the Bean of St. Ignatius has come into use through the agency of a recipe advertised by a certain individual of Brooklyn, N. Y., some of our physicians have employed the extract, and if we are correctly informed, observed effects from it not entirely attributable to the strychnia it contains. We published a formula for the extract in vol. iii. 3d series, page 227 (1855.)

Since then a tincture has been prescribed, and as we are not aware of a formula for its preparation having been published, the following is given as embracing the strength intended by the prescriber. The proportions are those of the officinal tincture of nux vomica, but the strychnia strength of the preparation is greater and the dose consequently less.

Take of Beans of St. Ignatius, four ounces troy.

Alcohol,

Water, of each a sufficient quantity.

Reduce the beans to coarse powder by mill or pestle (which is an operation involving labor,) moisten the powder with two fluid ounces of water and in any suitable bottle, cork it and heat by a water bath until the powder is swollen, then pour on half a pint of alcohol and digest for three hours by the same means, when the contents of the bottle may be thrown on a percolator and slowly displaced with alcohol until a pint of tincture is obtained.

The tincture by this process may be well made in a short time, but if made by maceration, in alcohol only, at least two or three weeks should be allowed, owing to the horny, close texture of the beans, the bassorin in which resists the action of the solvent on the enclosed strychnia and brucia salts. The dose of this tincture prescribed was ten drops three times a day.

Tincture of St. Ignatius's Bean may be made extemporaneously from the alcoholic extract, using half an ounce of extract to the pint of alcohol, or fifteen grains to the fluid ounce. The quantity of extract is based on the assumption that it is of average strength. When however it is purely alcoholic, three drachms is sufficient, and if hydro-alcoholic it may require five drachms. Owing to the variable quality of the extract in the shops it is safer to make the tincture at once from the beans, unless the actual strength of the extract is known.

Liquor Acidi Sulphurosi.

Aqueous solution of sulphurous acid has been repeatedly prescribed in this city, and although a *saturated* solution is called for, in practice such a preparation is not eligible as the natural variations in temperature cause the escape of gas. The following proportions and arrangement we have resorted to in making the solution :

Take of Copper turnings, - - four ounces.

Sulphuric acid, - - eight fluid ounces.

Put the copper in a tall flask of the capacity of three pints, and pour in the acid, set the flask securely in a shallow sand bath over a gas burner, and by means of bent tubes and corks connect the flask, first with an empty half pint bottle, and this with a bottle containing four pints of clear water, the tube passing down in the water nearly to the bottom. The joints should be carefully made and luted, and the bottle of water to be charged should be set in a vessel of cold water. Heat should then be applied to the sand bath until effervescence commences, and then carefully regulated so as to prevent the black froth from passing over into the first vessel. As soon as the gas ceases to come over, remove the bottle of solution before the lamp is extinguished and put the solution in pint or half pint bottles, (according to the quantity usually prescribed,) nearly filled, and cork and seal them.

Extractum Anthemidis Fluidum.

At the request of a medical friend, who has a high opinion of the antiperiodic power of Chamomile in certain cases of obstinate ague, we prepared a concentrated solution of the flowers preserved by sugar and alcohol, of the strength of thirty grains to the teaspoonful, by the following recipe:—

Take of Chamomile flowers,	eight ounces (troy.)
Sugar, - -	eight ounces.
Alcohol,	
Diluted alcohol, of each	a sufficient quantity.

Bruise the chamomile thoroughly, pour on it a pint of alcohol and macerate for twenty-four hours, pack it moderately tight in a percolator, and pour on slowly diluted alcohol, until a pint of liquid has passed; then change the recipient, and continue the process until two pints more of tincture are obtained. Evaporate the first tincture by a gentle heat, or spontaneously to six fluid ounces, and the other in a water bath to four fluid ounces, mix the liquids, add the sugar to them, dissolve by a gentle heat, and finally add alcohol until the whole measures a pint.

The dose of this preparation is from one to two teaspoonfuls as an antiperiodic, or half a teaspoonful as a tonic.

CONTRIBUTIONS TO TOXICOLOGY.

Translated from Wittstein's Vierteljahreschrift by J. M. Maisch.

Poisoning by Helvella esculenta.

Dr. E. Hamburger, of Bromberg, describes a case of poisoning by *Helvella esculenta*, (common morell,) which occurred to a forest inspector, his wife and six children. The first symptoms, observed on the day following the partaking of the morells, were headache, nausea, vomiting, with pains in the belly; the sick took milk as an antidote, which proved unavailing, and 24 hours after the poisoning a physician was called, who ordered castor oil, oily clysters and cold fomentations to the head. On the next day Dr. H. was called, who found the three youngest children dead, the three others, between 10 and 15 years, suffering with the following symptoms: Somnolency, but not difficult to

wake, and then clear consciousness; eyes deeply sunk; face dark red, which turned pale as soon as the vomiting of green masses mixed with blood commenced; belly inflated, and very tender and painful; pulse quick, hard and short, changeable; skin hot, extremities cool; tongue dry, but no drink was asked for; stools slimy, with bloody stripes, but painless.

Dr. H. commenced the antiphlogistic treatment, internally purgatives with ether and ammonia, on account of the loss of strength, and with opium and valerian to the girls, on account of their convulsions. The next day all the symptoms were milder; prescribed an emulsion of oil; the youngest girl still suffered from drowsiness and vomiting; treatment with cold fomentations, oil clysters and sinapisms was continued. On the 18th day all had recovered. Exanthemata, as described by Niemann, swelling of the tongue or head, was not observed.

These fungi, according to all botanists and pharmacologists, are classed with the innocent and eatable ones, and have always been eaten without any bad consequences. The present case, however, seems to indicate that all fungi, under certain conditions, even the most innocent ones, are capable of furnishing the characteristic fungus-poison; but these conditions are yet unknown.—*Deutsche Klinik*, 1865; *Dr. Wachtel's Zeitschr.*, 1855.

Poisoning of Chickens. By X. LANDERER.

The author was judiciously invested with the chemical examination of poisoned chickens, which he found were killed by orpiment, the yellow sulphuret of arsenic. Not a trace of the poison was found in the stomach and entrails; it had all remained in the crop, from which place, consequently, it had developed its deadly power.—*Wittstein's Viertelj.* v., 352.

NEW PROCESS FOR THE PREPARATION OF FERROCYANIDE OF POTASSIUM.

By RICHARD BRUNNQUELL.

This process depends on the conversion of ammonia into cyanide of ammonium by ignition with charcoal or carbonaceous matters; and its principal peculiarity consists in the conversion

of the cyanide of ammonium thus produced into cyanide of potassium, representing ferrocyanide of potassium, in the humid way. The gas containing ammonia is therefore passed through tubes filled with charcoal and heated to redness; the ammonia is thus converted into cyanide of ammonium, and this into ferrocyanide of potassium by contact with aqueous solution of potash and suitable iron compounds. The particular advantages of this method are the following:—

1. *The considerable loss of potash and the expense of its recovery are got rid of.*—The potashes are first dissolved in water, by which they are freed from the greater part of the foreign salts. The solution is then treated with a quantity of the cyanide sufficient to convert the greater part of it into ferrocyanide of potassium; this is allowed to crystallize, and the mother-liquor employed without further preparation for the same purpose. Thus we get rid at once of the contamination with silica, &c., and of the necessity of bringing the dissolved potashes again into a solid form, which is of itself a cause of loss.

2. *It becomes possible to replace the potashes by soda, which is much cheaper.*—By the old processes this was often tried in vain, because from the difficult reduction of sodium, the formation of cyanide of sodium in the dry way does not take place so easily, and moreover ferrocyanide of sodium cannot easily be crystallized from such impure solutions as the mother-liquors. The first difficulty is entirely got rid of in its formation in the humid way, and the second may also be overcome, as the solutions are much purer. Ferrocyanide of sodium certainly does not form such beautiful crystals as ferrocyanide of potassium; but if it can be prepared more cheaply, it will certainly make its way into use, especially as 6 parts of it go as far as 7 of ferrocyanide of potassium, the equivalent of sodium being lower.

3. *Bones may be employed in this process,* their subsidiary product, bone charcoal, covering the cost of the bones and their carbonization, and they would, therefore, furnish the nitrogenous gases for nothing. The gases from the carbonization of bones, are just as rich in ammonia in proportion as those of most other raw materials; in proportion to their weight, however, bones furnish less ammonia and much less gas.

4. *It is possible to bring back into the manufacture that portion*

of the ammonia which escapes conversion into cyanogen, and thus convert it also into cyanogen; the ammoniacal salts obtained as subsidiary products, may be converted into ferrocyanide of potassium, by mixing them with lime, and adding them to the raw material.—*Jour. Frank. Inst., Feb. 1857, and Chem. Gaz.*

THE SASSY TREE OF WESTERN AFRICA.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

MY DEAR SIR:—In the interesting paper, by Mr. Procter, on the Sassy tree of West Africa, which is reprinted in the *Pharmaceutical Journal*, xvi., 233, there is an error which I venture to ask you to allow me to correct, there being no evil in Modern Natural History so great as the excessive multiplication of names.

Mr. Procter says, that “as no specific name has been given to this tree,” he calls it *Erythrophleum giudicale*. It happens, however, that it had already two specific names, as will be seen upon reference to Hooker’s *Niger Flora*, an important systematical work, which all should study who write on the plants of the Gold Coast and neighboring regions. At p. 329 of the *Niger Flora*, Mr. Procter will find the following sentence: “1. *Erythrophleum Guineense* G. Don. *Gard. Diet.* 2, p. 424. *Fil-lœa sauveolius*, *Guill. et Perr. Fl. Seneg.* 1, p. 252, t. 55.”

I am able to state, from an inspection of Mr. Procter’s specimens, with a sight of which you have favored me, that his plant is identical with *Erythrophleum Guineense*, as, indeed, he will see if he turns to Guillemin and Perrottet’s very good figure of the plant. Therefore the name *judicale* must be erased from works of science.

Yours faithfully,

Acton Green, Dec. 18, 1856.

JOHN LINDLEY.

[NOTE BY THE EDITOR.—The essay referred to in Prof. Lindley’s note, was published nearly five years ago in this Journal. On the occasion of forwarding some specimens of American drugs, quite recently, to London, the opportunity was taken to send the specimens of *Erythrophleum*, upon which that essay was based, with the request that they might be shown to some prominent botanist, with the view of corroborating or correcting the statements it contained, as the author had some doubts in reference to the propriety of naming the tree, in the absence of more extended references to recent authorities beyond his reach.]

ON A NEW CINCHONA BARK AND ITS ALKALOID,
CINCHONIDINE.

By M. WITTSTEIN.

The author has obtained from M. Geith, of the firm of Ammon and Geith, of Nuremberg, a new Cinchona bark, which was forwarded to him from Hamburg as *Cortex Chinæ rubiginosus*. Its mode of packing was exactly like that of the *C. Calisaya*. Of its origin nothing further could be ascertained than that the bark was obtained from London, and the name was only attached to it in Hamburg.

From an exact examination, and a determination effected by Prof. Mettenheimer of Giessen, it appeared to belong to the genus of barks known under the names of *Cinchona flava*, *Carthagenæ*, *aurantiaca*, and *C. flava fibroso*, which are not rich in alkali.

According to the investigation made of this bark by the author, it has much resemblance to the *Cinchona regia* or *Calisaya*, but differs greatly therefrom in its chemical composition. The author therefore calls it

Cinchona pseudo-regia.—It forms strong, smooth fragments, without epidermis, and with a fibrous fracture; its taste is bitter, and its color is between that of *C. regia* and *C. rubra*. In the cold extract of 20 grs. of bark,—

Tartrate of potash produces a gray turbidity;

Tannic acid, a gray precipitate;

Perchloride of iron, a greenish-yellow color with a slight turbidity;

Oxalate of ammonia, a slight white turbidity;

Ammonia, a reddish-gray turbidity; and

Acetate of lead, a whitish turbidity, from which a reddish-gray precipitate gradually settles.

This bark contains a new alkaloid, which the author calls

Cinchonidine, $C^{18}H^{10}NO$.—It crystallizes in colorless, shining needles and prisms, 1 to 2 lines in length, belonging to the oblique rhombic system. It is inodorous and bitter. The cold, saturated, alcoholic solution has a distinct alkaline reaction; the ethereal solution has a very weak alkaline reaction, and the aqueous solution produces no change on vegetable colors. The alcoholic solution tastes extremely bitter, almost like quassia;

the ethereal and aqueous solutions of course taste less bitter in proportion to their smaller amount of alkaloid. On platinum foil it fuses into a colorless liquid, which evolves fumes smelling not unpleasantly like oil of bitter almonds: at the same time it becomes brown, ignites, and burns with a smoky flame, without leaving a trace of residue. By trituration it furnishes a snow-white electrical powder. The alkaloid loses nothing in weight up to 212° F., and even to its melting-point of 336° to 338° F. Its solubility is as follows:—

1	part dissolves in 398 parts of ether of sp. gr. 0.740 at 61° – 68° F.
1	... 88 parts of alcohol of sp. gr. 0.833 at 61° – 68° F.
1	... 19 parts of alcohol of sp. gr. 0.833 at boiling heat.
1	... 3287 parts of water at 61° – 68° F.
1	... 596 parts of water at boiling heat.

The new alkaloid behaves as follows towards reagents:—

Freshly prepared chlorine-water dissolves it readily without color; liquid ammonia, gradually dropped into this solution, produces at first a light, flocculent, grayish-white precipitate, which floats upon the dingy yellow fluid, but disappears with the greatest facility by the addition of an excess of ammonia, whilst the fluid again appears clear-wine-yellow. Concentrated sulphuric acid dissolves it rapidly; the solution is colorless, and undergoes no perceptible alteration by being gently heated. Concentrated nitric acid and concentrated muriatic acid behave in the same way. It also dissolves with the greatest facility in dilute acids, and saturates them completely. The solution in muriatic acid was prepared by adding the powdered alkaloid to 1 oz. of hot water acidified by the addition of 5 drops of muriatic acid of spec. grav. 1.13 until the last portion did not disappear. It did not alter either litmus- or turmeric-paper, and behaved towards some reagents in the following manner:—

Caustic alkalies produced white, densely flocculent precipitates, which rapidly acquired a granular crystalline appearance. Alkaline carbonates behaved in the same way; these precipitates dissolved quietly in acids after washing, so that they were free from carbonic acid. Phosphate of soda also gave a white, densely flocculent precipitate, which quickly became granular crystalline. Perchloride of mercury gave a strong white turbidity, which remained finely flocculent. Perchloride of gold gave a yellow tur-

bidity, which rapidly caked together into pale citron-yellow flakes. Perchloride of platinum furnished a pale orange-yellow, finely flocculent precipitate, which underwent no further change. Protonitrate of palladium gave a pale orange-yellow, finely flocculent precipitate, which also remained its original nature. Sulphocyanide of potassium produced a white turbidity, which quickly united into a granular crystalline form, and adhered firmly on the walls of the vessel. Iodide of potassium the same, except that the transition to the granular crystalline form took place more slowly. Biniodide of potassium gave a strong brownish-yellow precipitate united into thick flakes. Tannic acid, a milk-white, finely flocculent precipitate, which underwent no further change in its appearance.

By distillation with potash, the alkaloid appears to furnish chinoline. Analysis :—

C	77.363	77.272	18	=	1350	77.143
H	7.185	7.296	10		125	7.143
N	9.896	..	1		175	10.000
O	..	..	1		100	5.714

The *platinochloride* is a pale orange-colored precipitate, tolerably hygroscopic. It contained 28.47 and 28.49 per cent. of platinum (calculated, 28.495). This alkaloid is homologous with cinchonine, $C^{20}H^{12}NO$, cinchonine— $C^2H^2=C^{18}H^{10}NO$, cinchonidine.

In the investigation of the bark, &c., T. Crawford and H. Krombach took part. The following analysis of the ashes of the new bark was made by the latter chemist. The ashes consist for the most part of carbonate of lime.

1000 grs. of air-dried powdered bark lost 75 grs. by drying at 212° F. The remaining 925 grs. furnished 19.96 grs. of tolerably white ashes. The amount of ash in the air-dried bark therefore is 1.996 per cent., and in the bark dried at 212° F. 2.157 per cent. The composition of the ashes was—

Potash	.	.	5.32	Chlorine	.	.	2.23
Soda	.	.	5.82	Sulphuric acid	.	.	3.62
Lime	.	.	38.73	Phosphoric acid	.	.	3.31
Magnesia	.	.	0.50	Silica	.	.	6.33
Alumina	.	.	1.00	Carbonic acid	.	.	32.33
Oxide of iron	.	.	0.80				

Chem. Gaz., Jan. 15, 1857, from Wittstein's *Vierteljahr.*

ON THE PHYSIOLOGICAL AND MEDICINAL PROPERTIES OF CARBO-AZOTIC ACID.

BY GRACE-CALVERT and DR. J. M. MOFFAT.

It is only within the last few years that any attempt has been made to make use of the remarkable properties which this acid presents, discovered by M. Welter, and so well described by M. Chevreul in 1809.

One of us having been called upon, some years since, to seek a method of preparing carbo-azotic acid, which should be constant in its results, and at the same time not expensive, adopted after many trials the process recommended by Laurent, as being that which best fulfilled the required conditions; at the same time we have to state that great precaution is necessary to obtain carbo-azotic acid free from indigotic and oxalic acids.

The acid which we prepared is, as M. Chevreul has said, in small plates of a very pale yellow; it gives, even in dilute solutions, a precipitate with salts of potash.

The intense bitter of carbo-azotic acid suggested the idea that its employment in medicine might be useful; a certain quantity of this acid as well as of the carbo-azotates of ammonia, iron, nickel, and zinc, was placed in the hands of Dr. Moffat, and soon it was perceived that the above-named compounds would have therapeutic properties of great value, for they had much analogy with those of quinine.

It was remarked that the carbo-azotates of ammonia and of iron succeeded the best, the free acid being apt to cause cramps in the stomach. Carbo-azotate of iron has perfectly succeeded in several cases of cephalalgia; carbo-azotate of ammonia in cases of anemia, intermittent fever, and hypochondria. This salt mixed with gallic acid and opium has several times cured obstinate diarrhoea. Dr. Moffat has himself obtained more than twenty-seven cases of different cures by means of the carbo-azotates. The dose of carbo-azotate, which has been administered in pills, has been from 0.05 to 0.10 gramme per day. We are at present examining what is the minimum dose which can act on the system. That which renders the employment of these compounds exceedingly interesting is, that the patients become yellow as if they had a severe attack of jaundice, and as in this

last disease, not only the skin but also the conjunctiva of the eyes is colored. The time necessary for this coloration seems to vary according to the patients, from two to sixteen days, but the mean has been seven days. The quantity of carbo-azotate which has generally produced the coloration of the skin has been about a gramme. It disappears in two or three days after this product has ceased to be administered.

We have sought to discover the presence of this acid in urines, and the following is the process which we have followed:—The urines were treated by acetate of lead, rendered slightly acid by some drops of acetic acid. The abundant white precipitate which is produced was removed by filtration, and the liquor evaporated perfectly to dryness in an oil bath kept at a gentle heat. The residue treated by ether gave an ethereal extract, which, evaporated to dryness, left a slight residue, which residue dissolved in distilled water, was divided in two parts, A and B. In A, was put boiled silk, which remained white as long as the patient was not colored, but it was otherwise during the whole time of the artificial jaundice. The depth of coloration that the silk takes augments with the quantity of carbo-azotate administered. The portion B was mixed with alcohol and ammonia, and then a current of sulphuretted hydrogen was passed through it for half-an-hour. When carbo-azotic acid was present the solution became red by the formation of picramic acid, discovered by M. Gérard. By these means we have been able to detect 0.01 of carbo-azotic acid in 100 grammes of urine, even when it has been kept several days.

This coloration of the skin appears to us so important in a physiological point of view, that we are actively pursuing our researches not only on man but on animals. If Braconnot, who employed carbo-azotate of potash, did not obtain similar results, it was probably due to the insolubility of the salt employed, or that he did not use true carbo-azotate of potash.—*Chemist*, Sept. 1856.

ALUMINIUM—THE PROGRESS IN ITS MANUFACTURE.

BY W. J. TAYLOR.

[From the Proceedings of the Academy of Natural Sciences of Philadelphia, January, 1857.]

The use of sodium in the reduction of metals from their chlorides, as has been so successfully accomplished within the last two years, may be justly considered a great progressive step in science.

Aluminium has been the first in which this process has been perfected. What the other metals are which will be reduced successfully from their chlorides by the use of sodium, the future will determine. Some facts concerning the early history of aluminium, the progress made in its manufacture, and the numerous uses to which it can be applied, will not be uninteresting.

Much confusion existed in the minds of the early alchemists regarding the oxide alumina. They knew of an alum which was brought from the East, which they regarded for a long time as sulphuric acid combined with an earth. Stahl and others also mistook this earth for lime. Geoffroy, in 1728, pointed out its existence in clay; Marggraff, in 1754, proved it to be a substance having a separate existence and peculiar characters. To Oerstedt belongs the credit of first preparing the chloride of aluminium, from which compound Wöhler, in 1827, succeeded in first eliminating the metal. Wöhler first obtained aluminium in the form of a grey powder, by heating gradually in a porcelain crucible over a spirit lamp equal volumes of metallic potassium and chloride of aluminium; other chemists, by slight modifications of this process, have obtained aluminium in the form of the grey powder, as first obtained by Wöhler.

To M. Sainte Claire Deville belongs the credit for first improving the process, so as to produce aluminium in such quantities that its characters as a metal could be fully investigated. M. Ste. Claire Deville used in his process sodium as a substitute for potassium. (It requires 39 parts of potassium to produce the same reductive effect as 23 parts of sodium.) At the time of his first experiments sodium was worth one hundred dollars per pound; he so improved the process for making this metal as to reduce the price to ninety cents per pound.

At this time the chloride of aluminium was regarded with

sodium as a curiosity of the laboratory; it was then produced in small quantities by heating alumina mixed with coal, in a porcelain tube, and passing over it a current of dry chlorine gas.

M. Ste. Claire Deville made further improvements in this process, so as to make it in an apparatus as large as a gas retort and in quantities proportional, at a price of twenty-five cents per pound. To produce the reaction of sodium with the chloride of aluminium was the most difficult point of the entire process. M. Ste. Claire Deville used for the reduction the distillation of the chloride of aluminium over the sodium, which was placed in trays of copper enclosed in a tube. The temperature developed by the reaction is very great if the current of the chloride of aluminium be rapid; by this process it was found that it required at least ten pounds of sodium to produce one pound of aluminium, (part of the aluminium produced being destroyed at its formation by the scorizæ,) when by the theory it required only two and a half pounds. This great loss of sodium and the difficulties in conducting this reaction on a large scale, were very great objections to the process.

All the aluminium at the Paris Exhibition was made by this process, and it was from a portion of this that M. Regnault made his investigations, and in which he found copper and iron.

The copper came from the trays in which the reduction was made. The presence of these metals in small quantities will account for the peculiar physical properties which he ascribed to aluminium.

Circumstances having interrupted M. Ste. Claire Deville in the experiments which he was making on a large scale, the subject rested for a while here. In the meanwhile Heinrich Rose suggested and made experiments with cryolite, (a fluoride of aluminium and sodium, (and gave his views that this mineral was a valuable substance from which to produce aluminium.

Wöhler made experiments also with cryolite, and arrived at conclusions somewhat similar to Heinrich Rose. They both succeeded in producing some of the metal, but the results were not entirely satisfactory.

M. Ste. Claire Deville again resumed his experiments, but instead of distilling the chloride of aluminium on the metallic sodium, as in his first experiments, he fused in a crucible, in the manner

pursued by Rose and Wöhler, using, however, with the double chloride of aluminium and sodium and the metallic sodium, the fluoride of calcium, (fluor spar,) or some cryolite as a flux. This experiment of M. Deville was very satisfactory, and the reduction in accordance with the theory.

While these experiments were in progress in Europe, similar ones were being made in this country by Mr. Alfred Monier, in Camden, N. J.; to him credit is due for having first made aluminium in the United States. Having had opportunities for examining his processes for making the double chloride of aluminium and sodium, metallic sodium, and the modes of reduction, melting and refining the aluminium, the conclusion is satisfactory that the discoveries of science have been successfully applied to render the manufacture of this metal an industrial art.

Mr. Monier in his experiments met with the same difficulties in the reduction. He found, however, by careful investigation and analysis, that the effect produced was also perfectly in accordance with the theory. When, after great difficulties, sufficient quantities of pure aluminium were obtained, and its properties as a metal carefully studied, it was found that it was not in the least degree oxidized by fusion with the nitrate of potash. This peculiar property causes a strong contrast between it and any well known metal, and this wonderful fact produced a new phase in the manufacture of aluminium. Owing to this discovery, the efforts which had been made to produce aluminium from perfectly pure material was found unnecessary.

By using pure materials for its manufacture, it was necessary to employ apparatus which was very costly, as it required that it should be free from any injurious substances.

By the facility with which aluminium can be refined, owing to its peculiar properties to resist oxidation, it can be manufactured from impure and crude materials, in apparatus which can be cheaply made of still cheaper material, and without the great care and watchfulness necessary in the manipulations, where pure materials are employed.

Since July, 1855, Mr. Monier has made the double chloride by mixing alumina with salt (chloride of sodium) and coal, and by passing over this mass (ignited) a current of dry chlorine gas, (kaolin or common clay can be used instead of the alumina.) The

double chloride runs out from the condenser in a stream, and is collected in a receiver; it becomes solid when cold.

The reaction is so complete that no chlorine is lost. It has already been manufactured at a cost of eight cents per pound, but the operations were carried on to a very limited extent. It is, however, clearly (to be) demonstrated that, with works of sufficient size and a proportional economy in manufacture, the double chloride of aluminium and sodium can be produced at a cost not exceeding four and a half cents per pound.

In the manufacture of sodium Mr. Monier has made considerable improvement; it has already been produced at a cost of twenty-five cents per pound.

In the manufacture of zinc, (by the Belgian process) one retort produces about thirteen pounds of metal in 24 hours. In the manufacture of sodium the reduction is so quick that 52 pounds of this metal can be produced in a retort of the same size in the same space of time.

The reduction of zinc costs from two to two and a quarter cents per pound. The amount of ore necessary, being from a half to three-quarter cents per pound. Giving for the cost of one pound of metal about three to three and a quarter cents. The reduction of sodium costs about . . . 4 cents per pound. The carbonate of soda, $2\frac{1}{2}$ lbs., at 4 cts. . . 10 “ “

Giving for total cost of one pound of sodium, 14 “

Sodium can be manufactured on as large a scale as zinc, and when the workmen have the same practical experience in the manipulations, the price of reduction will be still further reduced, so that the difference between it and zinc will be that of the first cost of carbonate of soda and the zinc ore.

It has already been shown that the double chloride of aluminium and sodium can be produced at a very low price; metallic sodium can also be made very cheaply; the reduction is readily effected in accordance with the theory, but the difficulty in uniting the metallic globules of aluminium when formed, is obviated by stirring at this point with a rod, and the destruction of the metal by the alkaline scoria is prevented by adding to the charge of the double chloride of aluminium and sodium, chloride of sodium and metallic sodium, either fluoride of calcium (fluor spar,) or cryolite.

By these means the greater portion of the metal is united in one mass, the other portion of the metal in small globules remains with the slag, which can be removed mechanically, or by first digesting in water; there will, however, remain about ten per cent. with the slag. This will be explained by the following data. Theoretically:

250	parts of metallic Sodium produce
100	“ “ Aluminium ;
<hr/>	
70	parts are obtained in one metallic mass ;
20	“ “ in metallic globules ;
<hr/>	
90	“ being the nett produce.
10	“ remain with the scoria.
<hr/>	
Total,	100

The alkaline scoria contains large quantities of the chloride of sodium, that can easily be extracted by water, leaving an insoluble residue from which the fluoride of aluminium can be extracted by volatilization. The scoria containing the fluoride and the metallic aluminium is economically used by introducing it again with a new charge of the double chloride of aluminium and sodium, and metallic sodium, and by that means the loss of the metal is rendered very small.

Aluminium, when carefully removed from any slag, is readily fused in a crucible by itself; when in fusion (which is at a lower point than that required to fuse silver) the whole is stirred with a rod, and all the globules of metal are united in one mass with the greatest facility; at this point nitrate of potash can be added, (the stirring continued.)

All other metals are oxidized by this process; the refining is finished when the metal has a pure white color. It can now be poured into a mould of any shape.

Impure aluminium may be whitened by plunging it into caustic potash or soda, washing it quickly with distilled water, plunging it again into pure nitric acid, again washing quickly and thoroughly. The surface then has the color of fine aluminium, which it retains unless afterwards polished. This operation has for its

object to dissolve out the metals which darken the color of aluminium by their presence.

Aluminium forms alloys with nearly all the metals, but those which it forms with silver and copper are the most interesting.

Five parts of aluminium with one hundred parts of pure silver produce an alloy almost as hard as a silver-coin, which contains about one-tenth of copper, so that sufficient hardness can be given to silver, without introducing into it a poisonous or an alterable metal. It has the advantage of being worked like silver in a pure state, possessing, however, greater hardness, and being capable of a higher polish.

Ten parts of aluminium and ninety parts of copper produce an alloy of a pale gold color, possessing great hardness and considerable malleability; its hardness is greater than that of bronze, in the proportion of fifty-one to forty-nine. It can be worked when warm, with the same facility as the best soft iron.

Twenty parts of aluminium and eighty of copper give to the alloy the color and brilliancy of fine gold, and at the same time sufficient hardness to scratch the alloy of gold employed in coin, without impairing in the slightest degree its malleability.

By an increase of the per centage of copper in alloys of aluminium the alloy is rendered brittle, showing that the metal must be either used pure or alloyed in small quantities with the copper.

This explains the peculiar properties ascribed to it by M. Regnault in his investigation on the physical properties of the aluminium prepared by M. Deville, exhibited at the Paris exhibition.

Numerous experiments have been made (without regard to economy of manufacture) to obtain the aluminium directly from the oxide alumina, or from the fluoride of aluminium.

But the results obtained by the use of this double chloride of aluminium and sodium, have fully demonstrated that it is the most economical mode by which to produce this metal. Theoretically it requires—

3.86 Chlorine, at 6 cts. per pound	. . . . .	.23 16-100
1.86 Alumina, at 3 “ “	. . . . .	.05 58-100
5.68 Carbonate of soda, at 4 cts. per pound	. . . . .	.22 72-100
Total,		.51 46-100

Making for the materials for manufacturing one pound of aluminium, estimated at the market prices, $5\frac{1}{4}$ cents. Practically it requires—

16 lbs. of the double chloride of aluminium and sodium, at 8 cts. per lb.,	\$1 28
$2\frac{3}{4}$ lbs. metallic sodium, at about 26 cents per lb.,	70
Flux and cost of reduction,	2 02
<hr/>	
Total,	\$4 00

By manufacturing on a larger scale, and by using the slag as a flux instead of employing fresh material, the lowest cost will be reduced to the following :

10 lbs. of double chloride of aluminium and sodium, at $4\frac{1}{2}$ cts. per lb.,	\$0 45
$2\frac{1}{2}$ lbs. of sodium, at 14 cts. per lb.,	35
Cost of reduction,	20
<hr/>	
Total,	\$1 00

It is seen that the actual cost of one pound of aluminium, when manufactured extensively, will be about double the theoretical cost as before estimated, (fifty-one cents.)

For the production of aluminium are used clay, salts, sulphur, manganese, lime and fluor spar, materials which are very abundant and cheap ; all that is now required is practical experience, to reduce the price of the metal still nearer to the price of the raw materials, as has been before stated. The history of the useful arts contains numerous instances that, where skill and perfection of apparatus are required, difficulties are speedily overcome.

The density of aluminium when moulded is 2.56. The density of aluminium when rolled is 2.67. In equal weight with silver it is four times more voluminous. In equal weights with copper, bronze, brass and German silver, it possesses from three to three and a half times greater volume. In equal volumes with the above metals and alloys it possesses greater rigidity.

Mention has already been made of a very important property of aluminium when pure ; that is to resist oxidation, a property which it possesses to a greater degree than the other metals.

Aluminium is not acted upon by nitric acid, hydrosulphuric

acid, or by the organic acids; slightly by sulphuric acid. It is but little affected by fusion with sulphur; mustard is found to act upon it slightly. Its true solvent is hydrochloric acid.

When we compare it in these respects with those metals, which are acted upon by most of these acids giving salts, which are more or less poisonous, the comparison is favorable to aluminium, as its salts, if formed, are innocuous.

According to M. C. Tissier, aluminium is not changed by a solution of nitrate or sulphate of copper, but it is dissolved by a solution of chloride of copper with the separation of metallic copper. It is attacked, however, by a solution of nitrate or sulphate of copper when it contains chloride of sodium, and this proves that chloride of copper is formed by the presence of the chloride of sodium. Aluminium is not attacked by an aqueous solution of alum, or by one of chloride of sodium, but a mixture of the two dissolves it with an evolution of hydrogen, and this proves that chloride of aluminium is contained in the mixture.

Wheatstone long since showed that aluminium was as strongly electro-negative as platinum. Its sonorous qualities are very great, like that of crystal. Various are the uses which can be made of the aluminium and of its alloys with silver and copper. All the purposes for which it could be advantageously employed in virtue of its peculiar properties, of not tarnishing by exposure to atmospheric agencies, and its lightness combined with its extraordinary strength, would be far too tedious to enumerate. A few instances only will suffice of its adaptability for philosophical apparatus, for all articles for table, for service and ornament, for kitchen utensils, for the works of clocks and even watches, for trappings of harness, for plate and door knobs, keys, &c. Its sonorous qualities render it valuable for making bells. In the galvano-plastic arts it replaces platinum.

Aluminium is most easily soldered with its own alloys. The alloys most convenient are those with silver, zinc or tin, their point of fusion being below that of aluminium. The soldering may be done by means of a spirit lamp, and without any previous cleaning.

Pure aluminium can be easily distinguished from impure by its greater whiteness, its indistinct traces of crystallization; occasionally one or two well-defined hexagons can be recognized on the surface of the ingots. The impure has a bluish tint like

zinc, and if the entire surface is not crystalline, the upper surface is always more so than in pure aluminium; the form of the crystals is also quite different.

In giving the theoretical proportion of material employed in the manufacture of aluminium, the relative cheapness of its production, its properties and strength when comparing it bulk for bulk with other metals, it is desired to demonstrate its valuable properties and uses, also to guard against the fictitious reports so current of its excessive cheapness.

NOTE.—The experiment of Sir H. Davy should be mentioned in the early production of this metal; he endeavored to produce it by passing the vapor of potassium over alumina at a white heat; he obtained only small grey particles interspersed with aluminate of potash.

BENZINATED SOLUTION OF ALUMINA.

By M. MENTEL.

The following preparation, to which M. Mentel has given the name "Benzinated Solution of Alumina" may be considered as a good hemostatic.

Dissolve one kilogramme (2lbs. 8oz. Troy) of pure sulphate of alumina in two litres ($4\frac{1}{4}$ pints) of water. Saturate this solution with gelatinous hydrate of alumina, recently prepared, till it ceases to dissolve. Then add to this liquid 100 grammes (25 drachms) of amygdoloidal benzoin; bruised maintain the heat during six hours at a temperature of 140° to 176° Fahr., agitating from time to time, and regulating the evaporation so that the filtered solution will have a density of 30° Baumé, equal to a density of 1.261 at 59° Fahr. It is now filtered and put in a cool place (in the cellar in summer and at the temperature of 32° Fahr. in winter.) Some crystals of alum are thus formed by the union of the sulphate of alumina and some ammonia adhering to the gelatinous alumina, and separated. A transparent solution is thus obtained, of the density of about 1.250, remarkable for a very sweet odor and an astringent balsamic taste.

This benzinated solution of alumina not only possesses very decided anti-hæmorrhagic properties, but Prof. Laugier employed it with success in injections in leucorrhœa and ulcerations of the neck of the uterus, accompanied by fetid discharges. The strength is $2\frac{1}{2}$ to 5 drachms to a pint of water.—*Jour. de Phar. Janv. 1857.*

ON CRYSTALLIZED HYDRATE OF BARYTES.

By FREDERIC MOHR, PH. D., Coblenz,

Honorary Member of the Pharmaceutical Society of Great Britain.

Caustic barytes has been hitherto prepared by calcination of nitrate of barytes, or by boiling a solution of sulphuret of barytes with oxide of copper. The first process has been improved by me, by mixing the nitrate of barytes with coarsely powdered native sulphate of barytes, and heating the mixture in a crucible. By this simple manipulation the rising and overflowing of the fused salt has been entirely prevented. It has constituted until now the most expeditious and the cheapest process for preparing the crystals of hydrate of barytes.

The new process, for the first time here to be published, consists in precipitating caustic barytes by a solution of caustic potash or soda. The caustic soda is prepared from a pure carbonate of soda and caustic lime by the common method of boiling them together in a cast-iron vessel, until a filtered portion shows no more traces of carbonate of soda. The warm liquid is left covered for sedimentation, and after some hours' time the perfectly clear liquid is taken off by a glass syphon.

This is the solution of caustic soda to be used for preparing caustic barytes. To ascertain the quantity of any salt of barytes which can be decomposed by caustic soda, the alkalimetric strength of the soda must be previously determined. For this purpose ten cubic centimetres are taken off by a pipette, some drops of tincture of litmus are added, and then the strength is determined by a solution of oxalic acid of a certain and known strength, which is added until the color is changed to red. The strength of the solution of oxalic acid is prepared in the way originally suggested by Mr. J. J. Griffin, and recommended in my book *Die Titrimethode*, for volumetrical analysis. A litre of the solution contains sixty-three grammes of crystallized oxalic acid, thus representing the atomic weight of the acid. A cubic centimetre of this solution is therefore equal to the one-thousandth atom of any alkali. Supposing, then, that eight cubic centimetres of this solution were required to redden the litmus in ten cubic centimetres of the caustic soda, 800 cubic centimetres of the latter would decompose one atom of any salt of barytes. Ten cubic

centimetres of the solution of oxalic acid is the hundredth part of a litre, and one litre of the acid will saturate an atom of caustic soda. Therefore the number of cubic centimetres of the solution of soda required to saturate ten cubic centimetres of the solution of oxalic acid, must be multiplied by 100 to find the quantity required for one atom of a barytic salt. 800 cubic centimetres of this caustic soda would decompose 122 grammes of crystallized chloride of barium, or $130\frac{1}{2}$ grammes of nitrate of barytes. The first named salt is the cheaper and easier to be prepared; but when any trace of chlorine is to be avoided in an investigation, the nitrate of barytes should be preferred.

The solution of caustic soda is boiled in a cast-iron pan, and the weighed quantity of the barytic salt added to it. A precipitate will be produced in all cases, because the caustic soda is hardly free from carbonic or sulphuric acid.

The decomposition will be complete as soon as the barytic salt has been dissolved, and the insoluble product may be easily separated, in consequence of the great solubility of caustic barytes in boiling water. It may be effected by filtration, but the process of sedimentation will be found to be far more expeditious. With this view the liquid is left covered for some time in a warm stove, not hot enough to cause ebullition or the disturbance of the sediment, but sufficiently not to prevent crystallization.

The precipitate of carbonate and sulphate of barytes is deposited very quickly, and after half an hour the liquid will be clear enough to be taken off by a syphon. It is put into suitable vessels of iron, china, or glass, from which free access of air is excluded, and set aside in a cool place to crystallize. The whole liquid often crystallizes into a solid mass of acicular crystals of caustic barytes, the mother-liquor being entirely absorbed by the mass. The crystals are put into a funnel, and when the greater part of the liquid has drained away, the funnel is placed in an oblique direction in a centrifugal engine, and by the rapid motion of the engine much of the remaining mother-liquor is thrown off. The crystals are thus got in a state in which they will hardly wet filtering paper when placed upon it. By re-dissolving in a small quantity of boiling distilled water, and crystallizing a second time as before, the crystals are obtained in a sufficient state of purity.

By this means large quantities of caustic barytes can be prepared at a cost not much greater than that of a common salt of barytes, and this substance may therefore be applied for purposes for which it was previously inapplicable on account of its high price.

I may be permitted here to allude to the preparation of caustic potash for mineral analysis. It is very difficult to obtain caustic potash from the carbonate, so as to be free from silica, chlorine, and sulphuric acid, but sulphate of potash being free from silica and chlorine, and one of the purest of the salts of potash, it is very easy to prepare the caustic alkali from the sulphate by means of caustic barytes. If the barytes has been made from the nitrate, it will contain no chlorine; silica cannot be present, and sulphuric acid will be completely precipitated.

Common caustic potash, which has been prepared with carbonate of potash and lime, can be deprived of the last traces of carbonic and sulphuric acids, by adding the requisite quantity of caustic barytes and leaving the mixture for the precipitates to subside. This cannot be affected with caustic lime, as that substance is too little soluble in water, and is, moreover, incapable of decomposing sulphate of potash.

A solution of caustic barytes is used for absorbing carbonic acid from gases; but in this case, as the absorption proceeds, the solution becomes progressively weaker. I have suggested the use of a mixture of caustic potash and barytes for the same purpose, with complete success. The caustic potash absorbs the carbonic acid, and the barytes precipitates it. In this way the absorbing liquid—the potash—is kept always of the same strength and completely caustic, while the carbonic acid, as it is absorbed, is eliminated by precipitation.

Carbonic acid is more difficultly absorbed in proportion to the extent of its admixture with permanent gases which are not subject to absorption. This result is experienced in the analysis of atmospheric air, where there are only four or five volumes of carbonic acid in ten thousand volumes of the air. Hence the determination of the quantity of carbonic acid in air has been attended with much uncertainty and difficulty. The simple absorption by solid substances in tubes, and the determination of the increment of weight, as proposed by Brunner and other

chemists, has given most erroneous results. In that process the air must be completely dried by sulphuric acid or chloride of calcium. Now, it has been found that sulphuric acid absorbs no inconsiderable quantity of carbonic acid, which will not be got in the tube in which that body is proposed to be estimated. Then chloride of calcium is decomposed by the ozone of the atmospheric air, and loses an atom of chlorine for every atom of active oxygen or ozone. The chlorine thus disengaged is absorbed by the caustic potash or lime, and causes an increment of weight, which would be erroneously ascribed to carbonic acid. Thus, in some cases in which the air has been very dry, the chloride of calcium has lost rather than gained weight by the passage of the air through it.

It has, therefore, been found necessary to recur to the old process of Saussure. But the trouble of exhausting large balloons by an air-pump, the costliness of the whole apparatus, and the impossibility of transferring it from place to place, have prevented Chemists from generally adopting this process. Hence Saussure's results stand alone, being unsupported by parallel experiments. It has, however, been found practicable to effect the complete absorption of carbonic acid from atmospheric air with a mixture of caustic potash and barytes, by causing the air to pass through a glass tube of from sixteen to eighteen inches in length, and three-quarters of an inch in diameter, placed in an oblique direction. The current of air is produced by the dropping of water from an aspirator in connexion with the absorbing apparatus. Single bubbles of air rise in slow succession through the obliquely-placed tube, and are thus kept for about ten seconds in contact with the absorbing liquid. The air passes into the apparatus in its ordinary state, deprived neither of moisture nor ozone, as these substances do not interfere with the result. The volume of air is ascertained by measuring the water, and reducing it for pressure and temperature. The carbonate of barytes from forty or fifty litres of air is so small a quantity, that it cannot be well determined by weighing it upon a filter, and I have adopted the method of determining this quantity by a solution of nitrate of silver, which gives uniform results and is very accurate. This process is described in my work on Volumetric Analysis.

In conclusion, it may be predicted, with great probability, that caustic barytes being once easily and cheaply prepared in large quantities, will be applicable, not only to scientific researches, but also to industrial and commercial purposes.

MR. REDWOOD said the Society was much indebted to Dr. Mohr for this valuable practical paper. The method suggested for the preparation of crystallized hydrate of barytes appeared to be a very good one. The proposed applications of caustic barytes were also well worthy of consideration, especially that which related to the production of pure liquor potassæ. This was often required for analytical purposes, and Chemists not unfrequently found it difficult to obtain the preparation in a sufficient state of purity to render it suitable for use in some cases, as, for instance, in the separation and estimation of alumina. If used, as Dr. Mohr suggested, for purifying the liquor potassæ made in the usual way, much caution should be exercised to avoid leaving baryta in the solution, especially if it was intended for use in medicine, as barytes possesses poisonous properties.—*Trans. Lond. Pharm. Society, in Pharm. Jour. Dec. 1856.*

IODISED GLYCERINE IN VARIOUS DISEASES OF THE SKIN.

By DR. RICHTER, of Vienna.

This solution is prepared by dissolving one part of iodide of potassium in two parts of glycerine, and pouring this liquid on one part of iodine, which it dissolves completely. This solution has the great advantage over alcoholic solutions of not drying; in consequence the surfaces remain supple, and the action and absorption of the iodine continues for a long time. To use the solution it must be spread upon the diseased parts and covered with gutta percha paper to prevent the evaporation of the iodine, and to augment the perspiration of the parts which have been touched. The apparatus is left untouched for twenty-four hours and the degree of the reaction regulates the further application, as for example, bathing with cold water and fresh application. The iodised solution occasions pain, which varies in intensity and duration, according to the state of the diseased part and the sensitiveness of the individual. There has, however, never been

any general inconvenience. On removing the apparatus, the healthy skin has become brown and the diseased portions paler colored than before. On ulcerated surfaces, no trace of iodine will be found two hours after its application. Sometimes the action has been sufficiently powerful to produce *phlyctene*.

The results of Dr. Richter's experiments is, that this tincture acts as a caustic; that it has a really heroic action in cases of lupus, that its efficacy is remarkable in non-vascular gôitre, scrofulous ulcers, constitutional syphilitic ulcers; doubtful in primitive chancres and eczema, and *nil* in psoriasis. The following is one case of lupus cured:—

A man had been troubled with hypertrophic lupus from his childhood; his face was utterly disfigured, ulcerated in several places, and in which two holes represented the eyes, and a circular opening the mouth. The skin of the neck was so much thickened that there was a straight line from the chin to the sternum. To diminish the pain of the application of the iodised solution on so extensive a surface, it was divided into two portions, first the neck and lower jaw and after their cure, the rest of the face. Each application occasioned pain for about two hours, and from the very first iodine was found in the urine in large quantities. The hypertrophy diminished by degrees, the ulcers became covered with a very thin epidermis which gradually thickened and then became small flat cicatrices. Fifty-five cauterisations in the space of three months sufficed to produce a complete and unhopd for cure.—*London Chemist, from Wiener med. wochens-schrift.*

THE GUMS AND RESINS OF COMMERCE.

By P. L. SIMMONDS.

(Continued from page 80.)

Leaving the true gums, we come now to the RESINS. These are either natural exudations or are obtained from some vegetable compounds by the aid of alcohol, in which they are generally soluble, although totally insoluble in water. They are for the most part brittle, tasteless or insipid, fusible at a moderate heat, soluble in the fixed and volatile oils, and some in the muriatic and acetic acids. They have no smell, except when they retain

a portion of volatile oil, in which case they partake of the smell and acid taste of that oil. Resins generally burn with a strong yellow flame, emitting at the same time a vast quantity of smoke. Dammer affords a good example of the resins.

It is strange that of the origin of substances at once so valuable and so familiar to us so little should be known. The sources of the dammer and many of the wood oils from Singapore and the Eastern Archipelago are little known, nor are the copals, the anime, the myrrhs, and other valuable gums and resins from Africa, Zanzibar, &c., well defined.

COLOPHONY, the ordinary resin of commerce, is the residuum remaining in the body of the still after common turpentine has been submitted to distillation for the manufacture of the oil of turpentine of commerce, or spirit of turpentine. The black resin, or colophony, is the cooled brittle mass in the state in which it leaves the still; the amber or yellow-colored is the same resin mixed with about one-eighth part of water while it is yet fluid.

Large quantities of resin oil, or pine oil, as it is generally called, are made in the metropolis and in the neighborhood of Liverpool, Hull, Bristol, and Glasgow, and it is employed in the manufacture of grease for lubricating the bearings of heavy machinery, and the axles of railway wagons, &c. It is much used in France for the manufacture of printing ink, and hence a principal source of the unpleasant odor of some of the French newspapers. About 23,000 tons of rosin are annually imported, of which the bulk comes from America, and a little from the Hanse Towns. One of the most important oleo-resins in a commercial point of view is turpentine, of which we import from 17,000 to 25,000 tons per annum, almost exclusively from the United States. The comparative receipts in the last nine years have been as follows:—

	Tons.		Tons.
1846, .	17,897	1851, .	21,790
1847, .	16,193	1852, .	24,080
1848, .	20,089	1853, .	19,650
1849, .	20,666	1854, .	17,038
1850, .	21,731		

In the State of North Carolina, about 800,000 to 1,000,000 barrels of turpentine are now annually made, giving occupation

to about 5000 laborers in making it, and perhaps three times as many more human beings are supported mainly from the proceeds of its first sale. There are about 200 stills in operation there. The income of North Carolina from her pineries alone must reach half-a-million sterling.

The multifarious uses of the pine tree seem to augment with the development of the inventive talent and ingenuity of the age. Manufacturers already extensively use it in various processes. The painter draws deeply upon the turpentine to paint the four million of dwelling houses in Great Britain, and the same number in the United States, besides the carriages and other vehicles. That great lever of public opinion, the press, could not put forth a printed page without it. Turpentine to the value of £50,000 or £60,000 is annually consumed in America by the India rubber manufacturers. The new process of lighting up houses and whole cities with rosin-gas in America is consuming every barrel made, and has greatly raised its price there. The soap-maker, too, has long used it, and could not now dispense with it.

A liquid resinous exudation known as Chian or Cyprus turpentine is obtained from Syria and the Greek Archipelago from *Pistacia terebinthus*. The trunks of the largest trees are cut across with a hatchet, and the turpentine runs down on flat stones placed for the purpose, where it hardens. The quantity obtained from each tree is only about eight or ten ounces.

The coniferous trees of Europe and America furnish the turpentine, tar, and pitch of commerce, especially in Europe, *Pinus sylvestris*, and *P. pinaster*.

The swamp or long-leaved pine supplies the chief portion of the turpentine, tar, &c., consumed in or exported from the United States. *P. taeda*, abundant in Virginia, yields common turpentine, but of a less fluid quality than that which flows from the preceding species.

The resins are chiefly used in making varnishes and lacquers, for several purposes in dyeing, for sealing wax, and for ornamental house papering.

Varnishes may be divided into three classes, spirit varnishes, volatile oil varnishes, and fixed oil varnishes. The first class

are easily prepared and applied, dry quickly and are free from unpleasant smell; they are used for articles of furniture and musical instruments.

The resins which enter into their composition are seedlac, benzoin, anime, or thus. The varnishes made with essential or volatile oils are chiefly used for pictures—caoutchouc, and oil of turpentine, (turps, as it is familiarly termed,) enter into their composition. Fixed oil or fat varnishes dry easily, at common temperatures, and form a solid and nearly colorless glazing suited for coach paneling and house painting.

The fine copal varnishes do not dry so readily as if mixed in the proportion of three parts of anime and one of copal. Oil varnishes require to be kept a considerable time to ripen, as it is technically termed, before they are fit for use, the time varying from three to twelve months, according to the purpose for which they are intended, in order that the driers and other feculencies may be deposited and the varnish become bright and transparent.

Varnishes are very extensively employed in the arts and for domestic purposes. When we consider the large number of vehicles in use of various kinds, the superior classes of which, as private coaches, omnibuses and cabs, railway carriages, and the paint-work of ships' cabins, houses, and household furniture, pictures, &c., all require varnish, we shall be able to form some slight idea of the consumption. The tenders for one railway company alone, the London and North Western, are for 1500 gallons at a time. Gold and bronze lackering, and varnish for stoves, &c., are other uses. The recent permission to use methylated spirit in the manufacture of varnish, free of duty, bringing down the price some 10s. to 12s. a gallon, will give even a further stimulus to the demand for resins, and probably lead to the more general employment of varnishes for wood-work instead of paint.

According to Thunberg, the very best Japan varnish is prepared from *Rhus vernifera*, which grows in great abundance in many parts of that country, and is likewise cultivated in many places on account of the great advantages derived from it. This varnish, which oozes out of the tree on being wounded, is procured from stems that are three years old, and is received in some proper vessel. At first it is of a lightish color, and of the

consistence of cream, but grows thicker and black on being exposed to the air. It is so transparent when laid pure and unmixed upon boxes or furniture, that every vein of the wood may be seen. For the most part a dark ground is spread underneath it, which causes it to reflect like a mirror, and for this purpose recourse is frequently had to the fine sludge, which is got in the trough under a grindstone, or to ground charcoal; occasionally a red substance is mixed with the varnish, and sometimes gold leaf, ground very fine. This varnish hardens very much, but will not endure any blows, cracking and flying almost like glass, though it can stand boiling water without any damage. With these the Japanese varnish the posts of their doors, and most articles of furniture which are made of wood. It far exceeds the Chinese and Siamese varnish, and the best is collected about the town of Jesino. It is cleared from impurities by wringing it through very fine paper; then about a hundredth part of an oil called *toi*, which is expressed from the fruit of *Bignonia tomentosa*, is added to it, and being put into wooden vessels, either alone or mixed with native cinnabar, or some black substance, it is sold all over Japan. The expressed oil of the seeds serves for candles. The tree is said to be equally poisonous with the *Rhus vernix* or American poison tree commonly called swamp sumach.

The varnish tree of the Burmese (*Melanorrhœa usitatissima*) is spread over a wide range of country, extending from Memipur, in lat. 25 N. long. 94 E., to Tavoy, lat. 14 N., long. 97 E. It attains its greatest size in the valley of Kubba, distance about 200 miles from the sea-shore. The trees average about 30 or 40 feet high, and have a circumference of from five to eleven feet, four feet above the ground. A good tree yields from 10 to 12 lbs. of varnish annually, and its value at Prome, on the Irawaddy, is about 10*d.* the pound; it is used in enormous quantities by the natives as a lacquer.

Dr. Wallich states that the natives never experience those deleterious effects from handling the varnish in its liquid state, which Europeans generally suffer; in its fresh state, it has very little pungency of taste, and is altogether devoid of smell. The natives are very apt to adulterate that brought to market with sesamum oil.

WOOD OILS.—This class of resinous oils, known in all the Indian bazaars as gurgun oils, is obtained by tapping certain trees of the order Dipterocarpeæ (*D. lævis*, Hamilton; and *D. turbinatus*, of Roxburgh), and applying heat to the incision. The tree is a native of Chittagong, Pegu, Assam, the valley of Kubba, and the jungles of the Malayan peninsula, and grows to a great height. It is described as having a straight stem, of more than forty feet to the first branch. When not tapped too soon, the base of the trunk is often of immense girth, having a circumference of thirteen feet and upwards. About the end of the dry season, that is, in March and April, several deep incisions are made with an axe into the heart of the wood, and a good sized piece scooped out; into these holes fire is placed, and kept burning until the oil begins to run, when it is received into a bamboo, and allowed to ooze slowly drop by drop. The average produce is about 40 gallons in each season. The oil which flows from the wound is a mixture of balsam and volatile oil, and when applied as a varnish to wood or other substance, the oil evaporating deposits a hard and durable coat of resin.

These wood oils are chiefly used as natural varnishes, either alone or in combination with colored pigments; also as a substitute for tar in paying the seams of shipping, and for preserving timber from the attacks of white ants. They are said also to be useful as an ingredient in lithographic inks. This oil has all the medical properties of some of the more esteemed balsams.

From the comparatively imperfect knowledge we possess of the trees from which these valuable substances are derived, the oils generally receive the names of the localities from which they are imported—hence there are wood oils from Canara, and the Madras Presidency, Malacca, Pegu, Moulmein, and Rangoon, Singapore, Tinnevely and China. The last named deserves notice, as being one of the substances of which the well-known and much prized Chinese lacquer is made. It is used in Singapore for painting the beams and wood-work of native houses, and may also be mixed with paint when not exposed to the sun.

DAMMER is the eastern name for a kind of indurated pitch or turpentine exuding spontaneously from various trees indigenous to most of the Indian islands. The principal species are *Dammara Australis* (Don), the Kauri tree of New Zealand, and *D.*

Orientalis, the pitch tree of Amboyna. The trees yield the dammer in amazing quantity, and generally without the necessity of making incisions. It exudes through the bark, and is either found adhering to the trunk or branches in large lumps, or in masses on the ground under the trees. As these often grow near the sea-side, or on the banks of rivers, the dammer is frequently floated away, and collected in distant places as drift. It is exported in large quantities to Bengal and China, and is used for all the purposes to which we apply pitch, but principally in paying the bottoms of ships. About 200,000 bundles of dammer are annually exported from Siam. Dammer fetches from 26s. to 32s. per cwt. in the London market. 100 to 300 cwt. of dammer and resin are annually exported from Ceylon.

The fruit of *Diospyros embryopteris*, a native of the East, is so glutinous as to be used in Bengal for paying boats. A cheap and ready substitute for tar for preserving cordage, &c., might easily be found in some of the numerous resins and gum elastics of India.

COPAL is a valuable and singular kind of resin that, according to some authorities, naturally exudes from different large trees found in the East Indies. Dr. Ruschenberger (*Voyage Round the World*) still asserts that it is a gum found about the roots, whence it is dug up in large quantities, and is often obtained from places where the tree had been grown many years before. The best copal is of a bright yellow color, as transparent as amber, in small rounded lumps or flat pieces, hard and brittle, but easily reduced to powder. Its specific gravity is about 1.100. When dissolved in linseed oil, it forms a beautiful varnish, which, when applied to pictures, snuff-boxes, tea-trays &c. gives lustre to the painting and brings out the colors. Copal is liable to be confounded with gum anime, which exudes from the roots of the locust tree (*Hymenæa courbaril*.)

According to M. Landerer, of Athens, there are three varieties of copal, differing from each other in their properties, viz., Brazilian, West Indian, and East Indian or Levantine copal. The latter variety is sold in the bazaars of Jerusalem, Mecca and other places, as a species of choice incense, and it plays a leading part in all the fumigating drugs of the East. The people employed in the collection of the copal in Palestine and Abys-

sinia dig deep trenches round the tree, and then collect and sort the pieces of gum which fall into them. They are afterwards freed as much as possible of the earth that adheres to them by washing and stirring. African copal is obtained from a species of *Hymenæa*, and from fourteen to seventeen tons are imported to Liverpool from Sierra Leone. New Zealand copal is the Kauri gum; Brazilian copal is the produce of *Trachylobium Martianum*. The imports of gum copal, which in 1846 were 549 tons, dropped in 1849 to 200 tons. From the Phillippines we imported 354 of copal cwt. in 1851, 338 cwt. in 1852; and 479 cwt. in 1853; and from Singapore the imports have lately been increasing. In 1849 we received from that entrepot 53 cwt.; in 1850, 40 cwt.; in 1852, 218 cwt.; and in 1853, 521 cwt. The trade reports also record the import of 832 cwt. of copal from New Zealand in 1852, and from those islands 3217 cwt. of gum not enumerated, were received here in 1853. In commerce, copal is distinguished into the hard and soft kinds. The chief varieties of the former are—First, copal from Madagascar (in large flat yellow pieces), which, when cold, is tasteless and odorless, but when heated diffuses an aromatic odor: this kind is rather rare. Secondly, the East India copal, the most common commercial variety; it is rough on the surface, bearing the impression of sand. The best specimens are colorless, and in small pieces, constituting the copal from Calcutta. A third, but very small variety, is brought from the Brazils and south of Africa. We receive all the copal proper of commerce from India, whatever its primary source may be. In the Calcutta variety, pieces of all the others are to be found; nor is a distinction readily to be made between the white copal of Calcutta, and the yellow resin of Bombay; the difference appears to depend only on the care bestowed on the selection and purification of the pieces. The various resins, from anime to soft copal, Indian and Madagascar, seem to form a continued series, differing only in the increased quantity of oxygen they contain. A curious variety of copal is that in the pebble form, rounded by the action of the water, of which there are specimens on the table.

Copal is the Mexican generic name for all resins. In the collection of products from Mexico shown at Paris, there were several resinous gums, of which no particulars, however, were

obtainable—one, an unnamed resin, very much like anime; another termed Axin resin, which burns with little flame and blackens, having evidently much gum with it—a whiter kind, called Archipan resin, has much the same properties, and a bitter flavor. A nominal copal from the same quarter, resembles very closely the resin of Tacamahaca, being of a white color, with a coniferous smell.

GUM ANIME of commerce is a resin of great value to the varnish maker, but is now largely replaced by copal. Much of the anime received is believed to be the produce of the locust tree, *Hymenœa Courbaril*, and is, therefore, Western anime, the Courbaril resin of Demerara. It is obtained there by digging in the vicinity of the roots of the tree, from which it exudes in a vertical direction in columns or pieces, upwards of a foot in length. It may also be obtained by tapping the tree, when in the course of a few days a large solid mass is formed. It may be obtained in great abundance in various parts of British Guiana.

The best anime is, however, obtained from Zanzibar, and some other parts of Africa, whence it is imported in mats, and the fine and medium in cases. The imports are not large of gum anime. In some years it has reached thirty tons, in others it has not exceeded five or six. We now receive about 280 tons.

(To be continued.)

ALOINE.

BY MR. T. B. GROVES.

In the July, 1851, number of the *Pharmaceutical Journal*, appeared a paper by Messrs. Smith of Edinburgh, on Aloine, a crystalline principle they had succeeded in isolating from Barbadoes aloes, and which they regarded as its active principle. They proved also the existence of this body in a crystalline state in the Cape and Socotrine varieties, though they succeeded in obtaining from them only very insignificant quantities.

The behavior of aloine with reagents was fully detailed by them, and its formula supplied, as obtained by Dr. Stenhouse.

This latter Chemist also devoted considerable attention to the subject, and arrived at the same results as Messrs. Smith—that

aloine is scarcely obtainable in sufficient quantity, or in such a state of purity as to be recognizable, from any other than the Barbadoes variety.

M. Robiquet, in an article read to the Académie de Médecine, Feb. 26, 1856, and published in the *Chemist* of July, 1856, arrived at the same conclusion with regard to Cape and Socotrine aloes, but gives a much more easy and productive process for its preparation from Barbadoes aloes.

All these gentlemen express their belief that the opaque varieties alone contain any considerable proportion of aloine in a crystallizable state, and that the vitreous or translucent varieties have undergone the action of heat subsequent to inspissation, and that the fusion has converted the aloine into an amorphous substance, quasi-resinous. From a perusal of the works of the two first experimenters, and a consideration of what had hitherto been published respecting the manufacture of the different varieties of aloes, I was early led to doubt the accuracy of some of their conclusions.

For instance, Pereira states that the best Barbadoes aloes is procured by evaporating in a copper vessel over a naked fire the juice that spontaneously exudes from the transversely cut stems of the aloe (the decoction of the leaves is not unfrequently used), and that the evaporation is carried to such a point that the extract on cooling "breaks short"—in other words, has been reduced to dryness and incipient fusion.

The Socotrine, on the contrary, appears to be the pure spontaneously exuded juice of the cut leaves, evaporated, after depositing its grosser parts, by the sole agency of the sun.

If it be true then that aloine is so readily altered by contact of air, simultaneously with the application of heat, one would scarcely be justified in attempting its preparation from the former kind, without first applying to the latter.

Again, aloine is proved to be but slightly soluble in cold water; then why use cold for its separation? or ether, which dissolves it so sparingly?

I shall be able to show that Socotrine aloes contains a considerable proportion of crystallizable aloine, to be obtained from it without extraordinary difficulty or precaution.

The following circumstances that occurred shortly after the

publication of Messrs. Smith's paper, first suggested an inquiry. I was engaged in filling a small pot with the aqueous extract of Socotrine aloes, when I was called away for a short time, and on returning, observed that a bubble of considerable size had, by the gradual subsidence of the extract, formed on its surface. The extract, when first made, had been perfectly transparent, but the surface of the bubble I observed to be studded with bodies of a regular shape, which unassisted sight enabled me to recognize as crystals of aloine—the microscope afforded more certain evidence.

I will here observe parenthetically, that by cautiously blowing a bubble of a suspected extract, a very trifling amount of crystallization may be detected, that cannot readily be discovered in any other way.

The extract that afforded this indication had been prepared by exhausting Socotrine aloes with boiling water; filtering the cooled liquor, a little carbonate of magnesia being previously added; and evaporating by a steam heat. The exhaustion requires a little knack. The aloes should be closely powdered, and sifted through a 40-hole brass seive, then shaken lightly off a wide spatula into the boiling water, kept in constant agitation during the addition, and maintained in that state for twenty minutes after. The aloes will by this means be completely exhausted, and, by allowing the liquor to stand quiet till cold, the resinoid substances will deposit and adhere to the bottom and sides. The magnesia is added without decanting the liquor from the vessel. It filters very readily through serge, affording a perfectly bright liquid and extract. It is rendered turbid by the addition of acid.

Aloine has not been permanently introduced into medical practice in this part of the world, so that I had no inducement to prepare a larger quantity than sufficed for experiment. Indeed, in investigations in general, the smaller in reason the quantity of material operated on, the greater will be the care expended on it, and less dubious the results arrived at—the chief disadvantage being the loss occasioned by not being able to economise the mother-liquors.

One ounce of Socotrine aloes was therefore powdered and exhausted as previously described. When cold, hydrochloric acid

was added to slight acidulation—a resinous precipitate was formed, which caused filtration to proceed with great difficulty. The addition of finely-powdered wood charcoal would have much facilitated it. Washed arrowroot has not so good an effect. The solution was, after filtration, evaporated by a water-bath to the consistence of syrup, transferred to a small basin covered by bibulous paper, and set aside on a shelf of the laboratory.

In less than a week crystallization had commenced; in a fortnight it had become a mass of crystals, that had grown irregularly, considerably above the level of the liquid. They were transferred to coarse blotting-paper, allowed to drain a day or two, then shifted to another piece, wrapped in it, and gently pressed by means of a weight. Cautiously proceeding thus, they were at last powerfully pressed with a screw, and presented the appearance of a brown-colored brittle mass. This was dissolved in as small a quantity as possible of boiling water, allowed a few days to crystallize, and then treated as before. A third crystallization sufficed to procure crystals of a pale lemon color (pure aloine), which weighed when dry 48 grains—10 per cent. of the aloes employed. I found it was necessary to dry them in the compressed mass, closely wrapped in blotting-paper, and at a temperature of about 100. The surface and edges only were oxidized, and were removed before powdering and weighing. When thoroughly dry, it does not appear to undergo any change at the ordinary temperature. When damp, however, and at the same time exposed to heat, it oxidized rapidly, and could be made to assume almost exactly the appearance of the aloes whence it was originally taken.

I am therefore of opinion that it is not to their possessing a vitreous character, but to circumstances connected with the composition of the original juice from which they are made, that the various degrees of facility with which aloine may be obtained from them is due, and that aloine may be procured from all that have not been actually carbonized.

With respect to its purgative power, of which M. Robiquet denies it the possession, and which, to cause such variety of opinion, must at least be very uncertain, I think with M. R. that it is only when oxidized it possesses that power. It would be impossible for it to pass through the intestines without some de-

gree of oxidation, and that degree would vary as circumstances varied during its passage: the variation of its purgative activity is hereby accounted for. M. R. proposes to use it for the treatment of fever, &c., as an antiperiodic, and with the idea, I presume, of preventing its oxidation, and consequent aperient effect, gives it in combination with finely divided metallic iron (fer réduit).

Perhaps were the dose enveloped in wax or spermaceti, or still better, in Evans's membrane capsules, so that it may pass into the bowels previous to solution, the result would be more uniform.—*Pharm. Jour.*, Aug., 1856.

ON THE DETECTION AND ESTIMATION OF QUINIA AND OTHER ALKALOIDS IN FATTY OILS.

By WILLIAM BASTICK.

Having been required to examine some specimens of cod-liver oil with quinine, with a view to ascertain the presence of that alkaloid and its quantity in them, and there being no published method for the accomplishment of these objects, I have been compelled to devise one. Believing this method to be as simple as it is effectual, not only for the detection and estimation of quinine when dissolved in cod-liver oil, but also for the discovery and separation of other alkaloids when combined with the fatty oils in general, I venture to lay it before the Members of this Society. To render my method more intelligible, I will briefly describe an example of its actual application. Two ounces of the oil supposed to contain quinine were measured off, introduced into a bottle capable of holding four ounces of liquid, and then one ounce of a solution, consisting of sulphate of soda dissolved in distilled water, and slightly acidulated with sulphuric acid, was added. After closing the bottle, the contents were strongly and repeatedly agitated, so as to thoroughly mix the watery and oleaginous liquids. After these liquids had separated again by rest, half an ounce or rather more of the aqueous solution was removed from the bottle by means of a pipette, and passed through a filter, to separate a few small globules of oil still adhering to it. As half an ounce of this filtrate corresponded to one ounce of the oil under examination, care was taken to mea-

sure off this quantity correctly for the final operations, which consisted in precipitating the quinine therefrom by means of a solution of caustic soda, slightly washing the precipitate with distilled water, redissolving it in alcohol, and after filtering the alcoholic solution, evaporating it to dryness in a water bath. The residue was then weighed and examined in the usual manner, to ascertain if it were quinine.

I need scarcely explain that the sulphate of soda in the acid solution is employed to effect the more ready and complete separation of the watery fluid from the oily one, and that the sulphuric acid is added to dissolve out and combine with the quinine which exists in the oil in (if I may use the term) a caustic condition.

From experiments made with cod-liver oil with quinine, prepared by myself, of known strength, I feel justified in observing that the method described gives sufficiently accurate results to be relied on for all practical purposes.

In cases where other alkaloids have to be detected and estimated, the process of separation to be employed would be precisely similar to that described for the separation of quinine. When separated, they will of course be recognized by the methods laid down in the text books on chemical analysis.

In conclusion, I may add that the quantity of sulphuric acid employed in this process should be sufficient to render the aqueous fluid slightly acid after it has been well agitated with the oil containing the alkaloid, and that the proportion of the extracting fluid may be varied, in accordance with the convenience of the operator, and the nature and quantity of the alkaloid to be extracted.—*London Pharm. Journ.* Nov. 1856.

CHEMICAL RESEARCHES ON HAIR AND HORNY SUBSTANCES.

By M. VON BIBRA.

It has long been admitted, that the color of hair and fur is not due to a coloring matter, but that it depends on the structure of the appendages. This is also confirmed by Von Bibra's researches, in which he vainly endeavored to extract the coloring matter. On this point, microscopy may give more information than chemistry.

Hair, as well as the horny substances, is free from phosphorus; they contain sulphur in variable proportions, which the author has estimated in the following manner; the substance divided as much as possible, was burned with saltpetre containing carbonate of soda, the residue having been treated with nitric acid at the boiling temperature, the estimation is made by means of chloride of barium.

The following numbers refer to the sulphur contained in 100 parts of dried hair; two estimations were most frequently made of the same substance:—

Human hair.		Sulphur per cent.	
Woman of	93, grey hair, formerly fair . . .	4.30	
“	93, dark brown, mixed with grey . . .	4.17	
“	87, grey hair	4.76	
“	84, white hair	4.30	
Man of	81, white hair	5.76	
“	80, white hair	4.62	
Woman of	71, grey hair	4.08	
Man of	49, chesnut, mixed with grey . . .	4.63	
Woman of	40, dark chesnut	3.92	3.98
Man of	32, chesnut	4.36	4.37
“	30, red	8.23	7.77
Girl of	20, very fair	4.17	4.22
Boy of	18, red	4.21	4.12
“	16, chesnut	4.27	4.31
“	15, chesnut	4.69	4.64
Girl of	15, fair	4.27	4.31
Boy of	14, auburn	4.32	4.40
“	12, auburn	4.82	5.00
“	12, red	5.72	5.80
Girl of	10, chesnut	4.37	4.28
Boy of	9, red	5.22	5.34
“	3, fair	4.25	

Whence it may be concluded, that the average proportion of sulphur contained in fresh hair, is about 4.50 per 100.

This proportion has likewise been obtained with hair detached from the cranium of a Peruvian buried more than four centuries, and from an individual of the race of Titicaca, of nearly 1000 years ago.

These ancient hairs had not lost their hygroscopicity.

We sometimes meet with, in the soft parts of the organism, masses of hair resulting from an abnormal development, and which must not be confounded with the pellets of hair found in

the stomach of certain ruminating animals. Such masses sometimes exist in the ovaries of woman; it was on hair of this kind that M. Von Bibra operated; these hairs have also been found between the muscles of the thigh of an ox. These hairs contain one per cent. of sulphur, much less than the hair of the ox contains.

The furs of various animals, contain in general less sulphur than human hair; the author arrives at this conclusion, in consequence of a great number of experiments on the hair of the most various mammifera; sheep's wool contains the least, 0.81 per cent.; chamois hair contains the most, 5.10 per cent.

Sulphur of the Horny Substance.	Sulphur per cent.	
Ox horn	3.00	
Antelope's horn	1.17	1.30
Sheep's horn	1.72	1.75
Chamois horn	3.20	3.21
Rhinoceros' horn	3.09	3.20
Hare's hoof	2.90	2.91
Roebuck's hoof	3.02	
Chamois hoof	1.50	1.42
Sheep's hoof	1.12	1.28
Ox's hoof	1.51	1.37
Elk's hoof	0.86	0.88
Calves hoof	1.51	1.71
Dog's nail	2.80	2.69
Fox's nail	2.73	2.81
Bear's nail	1.25	1.48
Man's nail	2.71	2.74
Nail of hypertrophy	2.05	2.19
Whalebone	3.44	3.54
Skin cast off from the viper	0.88	

Fat and Inorganic Principles.

Hair and fur contain fat and mineral substances in variable proportions. Age and color appear to have no influence in this case. It is not the same with them as with feathers, which, according to M. Gorup-Besanez, contain so much the more inorganic matters, and especially of silica, as the bird is further advanced in age.

The mineral substances contained in the hair of man, are the sulphate of lime and sulphate of magnesia, phosphate of these bases, iron, silica, chlorine and a little alkali. Furs, silks and

horse-hair furnish ashes containing all the substances which have just been mentioned.

The ashes of the horns of the ox and the buffalo, those of the hoof of the ox and the roebuck, as well as the hoof of the elk, were rich in sulphates of lime and magnesia; there was also silica and traces of phosphate; there was neither chlorine nor iron; the ashes of hair and fur always contained carbonic acid; the ashes of horns and hoofs above mentioned were quite free from it.

The fatty bodies extracted from hair are for the most part composed of oleïne, margarine and margaric acid. M. Van Laer had already arrived at an identical result; however, M. Von Bibra found, only once, it is true, cerebrie acid, or at least an analogous matter; this was with woman's hair, which had fallen off spontaneously; this acid was, indeed, insoluble in cold ether, and, moreover, it contained nitrogen.—*Chemist*, Sept. 1856, from *Annalen der Chemie und Pharmacie*.

ON DECOLORIZING CHARCOALS, AND THEIR POWER OF ABSORBING SOME OF THE GASES.

BY JOHN STENHOUSE, LL.D., F. R. S.

The singular property which vegetable charcoal possesses of removing odors and coloring matters from solutions, was first observed by Löwitz towards the close of the last century. In 1811, Professor Figuier, of Montpellier, ascertained that animal charcoal or bone-black, as it is called, was immensely more efficacious as a decolorizer than any of the ordinary kinds of vegetable charcoal. M. Figuier's discovery was speedily confirmed by numerous other experimenters, and soon afterwards applied to the refining of sugar, for which bone-black has ever since formed one of the most important reagents.

The way, however, in which charcoal acts as a decolorizer, remained involved in considerable obscurity till 1822, when three prize essays on the subject were published by MM. Bussy, Payen, and Desfosses. M. Bussy's memoir was particularly valuable, and threw much light on the subject. Those of Payen and Desfosses, though less systematic and practical than M. Bussy's memoir, agreed with it in its general conclusions. These were

chiefly that the decolorizing power of the charcoal, though inherent in the charcoal itself, is entirely dependent on its physical state, especially on its extreme porosity and minute state of division. Thus, charcoal which has been strongly heated so as to become hard and lustrous by undergoing a species of fusion, scarcely exhibits any decolorizing power. On the other hand, charcoal, such as bone-black, which contains much saline and earthy matter, such as phosphate of lime, &c., as its particles are prevented from agglutinating, yields a dull non-lustrous material, possessing very considerable decolorizing power. Bussy found also that the distinction which had previously been drawn between vegetable and animal charcoals as decolorizers, was erroneous, and that charcoals, whether of animal or vegetable origin, should be divided into two classes, compact and lustrous, and porous and non-lustrous.

Till of late only two species of decolorizing charcoal have been employed in the arts. First. Bone or ivory black, made by calcining bones in close cylinders till the organic matter they contain is entirely carbonized. This is by far the most common of all the decolorizing charcoals, and is the only one employed in sugar-refining, and for decolorizing similar neutral solutions. It usually contains little more than 10 per cent. of carbon, and about 90 per cent. of phosphate and carbonate of lime. The second species of decolorizing charcoal is the so-called purified animal charcoal, which is made by digesting bone-black in hydrochloric acid, and edulcoration with water till all the lime-salts are removed. Purified animal charcoal, when carefully prepared, may be regarded as nearly pure charcoal, which has a dull lustrous appearance, and is extremely porous, provided that, after purification, it has been dried at a temperature little exceeding 212° . It decolorizes neutral and acid solutions exceedingly well; but, after being heated to redness, its texture becomes compact, and its decolorizing power is almost entirely destroyed. A second process for purified animal charcoal consists in intimately mixing blood or the fleshy parts of animals with pearlashes, and then calcining them in close vessels. The alkaline salt is first washed out with pure water, and then the last traces of the potash and lime-salts are removed by digestion with hydrochloric acid. The purified animal charcoal obtained

in this way is even more efficacious than that produced from bone-black. Such, then, was the state of our knowledge in regard to decolorizing charcoals till about eighteen months ago, when I first directed my attention to the matter.

As the cost of purified animal charcoal—about two shillings per pound—is very considerable, I was induced to procure an economical substitute for it, which could also be employed in acid solutions. This I effected by combining alumina with ordinary vegetable charcoal. The following is the process employed. Fifty-four parts of the sulphate of alumina of commerce, which is made by digesting the purest kinds of pipe-clay in pretty concentrated sulphuric acid, and which usually contains about 14 per cent. of alumina, were dissolved in water, and digested with $92\frac{1}{2}$ parts of finely-powdered ordinary wood charcoal. When the charcoal had been thoroughly saturated with the solution of sulphate of alumina, the mass was evaporated to dryness. It was then introduced into covered Hessian crucibles, or large muffles, and was heated to redness till all the water and acid had been dissipated. In this way a decolorizing charcoal was obtained, which, though it still appeared perfectly black, was thoroughly impregnated with anhydrous alumina. When sulphate of alumina and charcoal were employed in these proportions, a decolorizing charcoal was obtained, containing almost exactly seven and a half per cent. of alumina, which is the quantity of alumina which I have found, after various trials, to be the most effective, as it appears to be exactly the amount requisite thoroughly to coat all the cells of the charcoal; for, on increasing the quantity of alumina above seven and a half per cent., the charcoal did not gain any additional decolorizing power; and on diminishing the amount of alumina below seven and a half per cent., the decolorizing power of the charcoal was also diminished. After calcination in the way described, on being again carefully pounded, the aluminized charcoal was ready for use. A more economical method of preparing aluminized charcoal is, instead of employing dried sulphate of alumina to prepare a solution of sulphate of alumina of known strength, by simply digesting calcined pipe-clay in pretty concentrated sulphuric acid. Such an amount of the solution is to be employed as shall impregnate the charcoal with seven and a half per cent. of

alumina. In preparing sulphate of alumina, the chief point to be attended to is to employ a clay as free from iron and lime as possible, though the presence of a trace of iron is quite immaterial. A clay containing a considerable quantity of lime may likewise be made available, by previously removing the lime by digestion with hydrochloric acid. The charcoal, which is now produced in large quantity by the destructive distillation of sawdust for pyroligneous acid by Halliday's patent process, being almost a waste product, is exceedingly well adapted for aluminizing.

The aluminized charcoal may be employed to decolorize all acid solutions except those containing much free sulphuric acid; for, after being heated to redness, the alumina becomes so compact, that it is not soluble in any but pretty concentrated sulphuric acid. Aluminized charcoal decolorizes tartaric and citric acids quite as efficiently as either bone-black or washed animal charcoal, *i. e.*, bone-black digested for some time with hydrochloric acid, while it is much cheaper than washed animal charcoal, and does not introduce nearly so much inorganic matter into the tartaric acid mother liquors. The price at which aluminized charcoal can be produced does not exceed that of bone-black. The only two points required to be attended to, with regard to aluminized charcoal, are to employ it in very fine powder, and to boil it for a few minutes with the solution it is wished to decolorize.

I have repeatedly decolorized solutions of crude tartaric and citric acids with aluminized charcoal, and have invariably found that the aluminized charcoal possessed an equal decolorizing power with washed animal charcoal—the material usually employed by tartaric acid manufacturers. I likewise found that the aluminized charcoal introduced a very small quantity indeed of inorganic matter into the mother liquors, compared with that which always results from the employment of either washed animal charcoal or bone-black, as may be seen by the subjoined experiments. Equal quantities of crude tartaric acid were decolorized with the same amounts of bone-black, washed animal charcoal, and aluminized charcoal. When the resulting solutions were evaporated to dryness, they yielded, on incineration, the following quantities of fixed residue:—

Aluminized charcoal	0.32 per cent.
Ivory black	7.58 " "
Washed ivory black	3.40 " "

It is evident, therefore, that aluminized charcoal is especially well adapted for the decolorizing crude tartaric and citric acids, as it introduces such a very small quantity of inorganic matter into the mother liquors. And, doubtless, it is owing to their employing washed animal charcoal, and sometimes even bone-black, that the tartaric acid manufacturers find their mother liquors so intractable from the large quantity of inorganic salts they contain.

An artificial bone-black may likewise be produced by impregnating powdered wood charcoal with basic phosphate of lime, dissolved in an excess of hydrochloric acid, so as to impregnate the charcoal with seven and a half per cent. of bone earth instead of eighty per cent. as in ordinary animal charcoal. It is manufactured by a precisely similar process to that already described, the acid and water being driven off by ignition in close vessels. It decolorizes very well, but can only be employed in neutral solutions. It is evident that both aluminized and artificial phosphate of lime charcoals, just described, are merely mordanted charcoals, which decolorize solely by the bases or mordants which they contain.

Besides the aluminized charcoal, I have also prepared an additional substitute for purified animal charcoal, by means of hydrate of lime and a mixture of coal-tar pitch and coal-tar. The following is the process employed for this purpose. I take one pound by weight of coal-tar pitch, and gently heat it in an iron pot till it melts. I then add two pounds of fluid coal-tar, and mix the liquids. Seven pounds of hydrate of lime in very fine powder are next gradually stirred into the mass, which soon becomes thick and pasty. It is then gently roasted, the stirring being continued during the whole time till it is reduced to the state of a very fine powder. The great object of the stirring and roasting being to incorporate the lime with the vegetable matter as intimately as possible. The dark brown powder obtained in this way is then introduced into ordinary covered crucibles or iron retorts, and is ignited, until the whole of the vegetable matter is entirely carbonized. The mixture when cold is then

digested with dilute hydrochloric acid, thrown upon a filter, and finally washed with distilled water till everything soluble is removed. In this way an extremely porous, very light, nearly pure charcoal is obtained, which for some purposes, such, for instance, as decolorizing logwood and similar solutions, is four times as effective as the most carefully prepared purified animal charcoal. It likewise decolorizes impure gallic acid solutions admirably. This charcoal from coal-tar may likewise be prepared with much weaker hydrochloric acid than is required to remove the phosphate of lime from bone-black. Quick-lime in fine powder may likewise be employed instead of hydrate of lime, and also calcined magnesia and the light sub-carbonate of magnesia of the shops, but chalk, even when finely powdered, answers very badly indeed.

Instead of coal-tar and coal-tar pitch, some other vegetable substances, such as maize, wheat, and the various kinds of flour, common resin or colophonium, pitch, wood-tar, or bitumen, may be employed. When flour, resin, &c., are intimately mixed with carbonate of potash and calcined in close vessels, very good decolorizing charcoals are obtained, but I was surprised to find that carbonate of soda, either hydrated or dried, did not produce a similar result.

As was first observed by Messrs. Bussy and Payen, I find that every species of decolorizing charcoal acts with varying efficiency on each colored solution to which it is applied. Thus, for instance, one charcoal decolorizes a solution of indigo better than it does one of logwood, syrup, or tartaric acid, while another charcoal will decolorize a solution of logwood more readily than one of molasses ; and so of others.

As the result of this investigation, I think that decolorizing charcoals may be very properly divided into three classes : First, into those which, like the purified and the coal-tar charcoals, above described, may be regarded as merely pure charcoals in an extremely minute state of division, and which decolorize by their porosity alone. Second, into those mordanted charcoals which, like aluminized charcoal, and artificial phosphate of lime charcoal, decolorizes solely by the mordants or bases which they contain. Third, into bone-black, which is a composite charcoal, and decolorizes, partly, by the large quantity of phosphate of lime, and partly by the ten per cent. of minutely divided charcoal which it contains.

The propriety of this classification may be made very plain by a simple experiment. If equal quantities of purified animal or coal-tar charcoal, aluminized charcoal, and bone-black, are boiled in decoctions of logwood till they are saturated with coloring matter, and if they are then thrown upon filters, which are washed with dilute solutions of aqua ammonia, the ammoniacal solution from the aluminized charcoal will be of a straw, yellow color; that from the bone-black will be somewhat deeper; while those from the purified animal and coal-tar charcoals will be nearly as deep as ink. This evidently shows, that in the case of the aluminized charcoal, the coloring matter was in true chemical combination with the alumina. In the bone-black, this was also partially the case, while in the purified animal charcoal, no true chemical combination had been formed, but the coloring matter was merely retained by the porosity of the charcoal.

I shall conclude this paper by shortly noticing some experiments on the power which the various decolorizing charcoals possess of absorbing three of the gases, viz., ammonia, carbonic and hydrochloric acids. Their results, which are somewhat anomalous, I have thrown into the subjoined tabular form. A gramme of each charcoal was employed. All the charcoals were decolorizers, except the platinized charcoal, which, as it consists of common wood charcoal, impregnated with a small quantity of metallic platinum, of course possesses no affinity for coloring matters.

Cubic centimetres of Gases absorbed by one gramme of various kinds of Charcoals.

NAME OF CHARCOAL.	NAME OF GAS.		
	Ammonia.	Carbonic acid.	Hydrochloric acid.
Common Wood.....	145	15	158.7
Common Animal.....	105	2.5	Not tried.
Purified Animal.....	210	No Absorption.	185
7½ per cent. Aluminized.....	212.5	12.5	177.5
7½ per cent. Phosphate of Lime	152.5	10	Not tried.
Pure Coal-tar Charcoal.....	335	No absorption.	130
5 per cent. Platinized.....	142.5	No absorption.	135

In connexion with the absorbent power of charcoal for gases, I may mention that the charcoal air-filters, respirators, and

bandages for putrid wounds, described by me in a former paper nearly three years ago, are now coming into very general use.—*London Pharm. Journ. Jan. 1, 1859.*

ON EXTRACT OF LIQUORICE.

By M. A. DÉLONDRE.

In the *Journal de Pharmacie* for December, there will be found a long report by Messrs. Hottot, Deschamps & Dublanc, on a note by M. Délonde on the preparation of extract of liquorice. It has often been asked why is there so large an amount of insoluble matter in even the best Calabria liquorice; and it had not been satisfactorily shown whether this is the result of the treatment of the root, or whether foreign substances are added, perhaps less with the view of adulteration than of giving the extractive matter that consistence requisite to form it into rolls.

The process indicated by M. Délonde consisted simply in treating liquorice root by displacement with hot water, and rapidly evaporating the infusion to the consistence proper for making rolls. The commission, in carrying this process into practice, were not able to arrive at the same result. In the comparison of M. Délonde's extract with their own and the commercial product, they tried their solubility in cold water, noting the rapidity of the process, the specific gravity of the solution, its spumosity, the weight left undissolved by a specified quantity of water, and the amount precipitated when alcohol was added in excess to such solutions.

The extract of liquorice made by the committee by Délonde's process was dry and shining, but softened by exposure to the air for a few days whilst the temperature was 77° to 86° Fahr., and lost its shape. Its taste is less agreeable than the commercial article, or that made by M. Délonde himself. The solution of the extract in cold water left 10 per cent. of insoluble residue, and the clear solution mixed with an excess of alcohol 95° caused 15 per cent. of matter to separate; in all 25 per cent. The liquorice prepared by M. Délonde did not lose its shape by exposure; its fracture was smooth and conchoidal; its taste less acrid than that made by the committee, though not as agreeable

as some of the commercial varieties. It contains 18.6 of matter insoluble in cold water; and an excess of alcohol precipitated 27.2 per cent. of matter from the watery solution; in all 45.7 per cent. of the weight of the extract.

The committee being at a loss to reconcile these results with the alleged purity of M. Délonde's extract, wrote to him an account of their labors, when he maintained his previous assertion, could not give the rationale, but proposed to join the committee in clearing up the difficulty, which he did by frankly explaining the *modus operandi* of his process. It is as follows:—

M. Délonde puts in a suitable vessel, 260 kilogrammes (573 lbs.) of liquorice root in coarse powder, and admits a current of steam during twelve hours. In this way the fibres of the wood are thoroughly penetrated and acted on, and the resulting condensed liquid drawn off. This treatment is renewed for five successive days, the several liquids are decanted, clarified with two kilogrammes (4.4 lbs.) of gelatine, and rapidly evaporated in jacketted boilers. The extract is removed, made into rolls, and put into a drying room kept at 77° Fahr. for ten days.

This explanation from the author of the process at once showed the cause of the difference, viz.: that the continued action of steam was capable of extracting principles insoluble in warm water.

To fully satisfy themselves, the committee requested M. Délonde to make four experiments:—

- 1st. To prepare an extract with cold water by displacement.
- 2d. To treat the residue with hot water.
- 3d. To treat the second residue by steaming.
- 4th. And to make an extract by his own process, direct from the root.

These several products were then examined by the committee.

1. The first extract amounted to 15 per cent. of the root treated; was soluble in its own weight of water, except 4.22 per cent., and when dissolved in 1000 times its weight of water, the solution had a decided liquorice taste. 100 parts dissolved in water yielded a precipitate of 36 parts by adding an excess of alcohol.

2. The second treatment yielded 7.5 per cent. of extract. The extract was hygroscopic; had a taste nearly as strong as the pre-

ceding; dissolves more slowly in water, of which it requires twice its weight for solution, with a residue of 4.7 per cent. Diluted with 1000 parts of water its taste and color are less marked than the first extract, and its strong aqueous solution, treated with alcohol 27.8 per cent., was precipitated.

3. The third extract, by steam, obtained from the woody residue of the two preceding extracts having been removed, amounted to 16 per cent. It was dry, hard, friable and nearly pulverulent. Its taste is sweet, without acrimony, and remains a long time in the mouth without dissolving. Put in cold water a portion dissolves, and an abundance of insoluble matter floats on the solution, amounting to 57 per cent. Dissolved in 1000 parts of water the solution has no characteristics of liquorice, and a solution of the soluble matter yields 18.4 per cent. when precipitated with alcohol.

4. Liquorice root treated by M. Délonde's method, yields from 42 to 45 per cent. of extract [in rolls. The extract is a shining black, smooth fracture, firm consistence, not softened when exposed to the air, and similar in its general relations to the best extract of commerce. Its taste is more decided, due to its greater purity. Dissolved in 1000 parts of water, a sweet colored solution is afforded, and alcohol precipitates from its concentrated solution 27.4 per cent. of matter.

The committee conclude their remarks by a favorable opinion of the process of M. Délonde, believing that it is necessary, in order to have a permanent extract to retain in it the insoluble matter taken up by the steam, however desirable it may be for pharmaceutical purposes to employ the pure soluble extract obtained by infusion.

ON PENGHAWAR DJAMBI, A NEW STYPTIC.

By DANIEL HANBURY.

A small package of the curious drug, known by the name of *Penghawar Djambi*, or by the not less barbarous designation *Pakoe Kidang*, was lately offered at one of the public drug sales in the city.

The drug consists of the lower part of the stalk or *stipes* of a large fern, native of the island of Sumatra. The stalks as im-

ported are in straight pieces, about a foot in length and an inch in width. They have mostly been split open lengthwise, perhaps to facilitate their drying. Their most striking feature, however, is the abundant clothing of long, sparkling, golden-brown, moniliform hairs, with which the outer part of the stipes is thickly covered, and which at the first glance suggests for the drug an animal rather than a vegetable origin.

Penghawar Djambi, though new to the English drug market, has for some years past been in the hands of the pharmacutists of Holland and Germany, and now has even a place in the Dutch pharmacopœia.*

The plant which affords it, is without doubt, of the genus *Cibotium*. Dr. Oudemans, in his Commentaries on the *Pharmacopœia Neerlandica*,† refers it to *C. Cumingii* Kunze, a fern of the Phillippine Islands, regarded by one of our best filicologists as not specifically distinct from the *C. Barometz* of J. Smith. On this point Mr. John Smith has been kind enough to reply to some inquiries I recently addressed to him, in a communication from which I extract the following:—

“I may safely say that the hairy stipes called *Penghawar Jambie* are produced by a species of *Cibotium*. Of this genus, six species are described in Sir W. Hooker’s *Species Filicum*,‡ viz: *C. glaucescens* Kze. (*Polypodium Barometz* L., *Cibotium Barometz* J. Sm.) and *C. Assamicum* Hook., from the Eastern hemisphere; *C. Sheidei* Schlecht. et Cham. from Mexico; and *C. glaucum* (*Dicksonia glauca* Smith, in Rees’s *Cyclop.*), *C. Chamdissoi* Kaulf. and *C. Menziesii* Hook., from the Sandwich Islands. All are characterized by having the rhizome or caudex and the base of the stipes densely covered with soft moniliform hairs. In the Eastern species, the rhizome is decumbent, and upon removal from the ground, might easily be formed by a little artful manipulation, into the fabulous *Vegetable Lamb* or *Barometz*. The plant which affords this production, was referred by Linnæus from Loureiro’s description, to the genus *Polypodium*, and called *P. Barometz*. Nothing further was known of it till about thirty years ago, when the late John Reeves, Esq., sent a living plant from China to the nursery of Messrs. Loddiges at Hackney, as the true *Barometz*. This plant increased and in time became an inhabitant of other gar-

* Pharmacopœia Neerlandica, 1851, p. 53.

† Aanteekeningen op het Botanische, Zoologische en Pharmacognostische Gedeelte der Pharmacopœia Neerlandica: Door C. A. J. A. Oudemans, M. D. Rotterdam, 1854, 1. Afl. p. 17.

‡ Page 82.

dens; it was not, however, till 1840, that it produced fructification, which it did in the Birmingham Botanic Gardens, a notice of which is recorded in the *Proceedings of the Linnean Society* for February, 1840. I then identified it as belonging to the genus *Cibotium* of Kaulfuss, and in my *Genera Filicum*, published in 1841, I recorded it under the name of *Cibotium Barometz*.

"In the Berlin garden it received the name of *C. glaucophyllum*, afterwards changed to *C. glaucescens* by Kunze, who figured it in Schukhr's *Supplement*, p. 63, t. 31. Since then (1846) dried specimens collected by Fortune and by Seemann, and corresponding with the living plant, have been received from China.

"Now for the name *Cibotium Cumingii*.—In 1840, Cuming brought specimens of a *Cibotium* from the Philippines, which in my enumeration of the ferns of those islands I named *Cibotium glaucum*,* then believing it to be the *Dicksonia glauca* of Dr. J. E. Smith (Rees's *Cyclop.*, vol. xi). Kunze, however, considered it a distinct species and named it *C. Cumingii*.

"After much examination of well authenticated specimens, I have come to the conclusion that *C. Barometz* J. Sm., *C. glaucescens* Kunze, *C. Cumingii* Kunze and *C. Assimicum* Hook., constitute one species only. I therefore retain the original historical name of *C. Barometz*, for the eastern type of the genus.

"It appears that the stipes called *Penghawar Djambi* comes from Sumatra. Although I have not seen any fronds of *Cibotium* from that locality, still, judging from the stipes in question, I see no reason to doubt the correctness of referring it to *Cibotium Cumingii*, which as above stated, I regard as not different from *C. Barometz*."

The authors of the *Pharmacopœia Neerlandica* quote *Agnus Scythicus* as synonymous with the Sumatran *Penghawar Djambi*, in which it is evident Mr. John Smith thinks them correct. They do not, however, attempt to fix the botanical origin of the drug, but merely refer it to "*Filicis species nondum satis cognita*."

Professor Miquel, on the other hand, while referring *Penghawar* to *C. Cumingii* Kunze questions its identity with *Agnus Scythicus* in these words:—" *Agnus Scythicus* seu *Barometz pharm.*, filicis etiam caudex est sed ab eo Cibotorum diversus."†

Having examined an ancient specimen of the so-called *Scythian Lamb* preserved in the British Museum,‡ as well as a living

* Journ. of Bot., vol. iii. (1841), p. 418.

† *Analecta Botanica Indica*, ii., 36.

‡ Probably the same specimen as is excellently figured in Rymdyk's Museum Britannicum, London, 1791, fol. Tab. xv., fig. 2.

plant of *Cibotium Barometz* J. Sm., I must confess I find them far more to resemble each other than they do the Sumatran *Penghawar*. It must, however, be borne in mind that a plant having a range so extensive as to embrace Assam, China, the Philippines and the Islands of the Indian Archipelago, may be expected to vary considerably according to the soil, the situation, and the degree of moisture and heat in which it may grow, so that I am far from impugning the correctness of referring both productions to one and the same plant.

* * * * *

Before dismissing *Penghawar Djambi*, we must, however, consider its reputed medicinal and surgical uses. As a styptic, the hair of the stypes may be employed in the same manner as cotton wool, tow, or the nap of a beaver hat. According to Dr. J. M. Van Bemmelen, who has elaborately investigated the chemistry of the drug,* the styptic action of these hairs is solely mechanical. Practitioners have tried the effect of an aqueous decoction of the hairs or of the stem, as a remedy for internal hæmorrhage, and some have reported favorably of it.† The experiments of Dr. Van Bemmelen leave little ground for placing any reliance on the reputed good effects of the drug so applied; and I fully concur in that writer's conclusions, as expressed in terms which I translate thus:—

“I therefore believe myself justified in the opinion that it is highly improbable that that which water extracts from this plant is an active remedy for internal hæmorrhages. There appears to me no grounds whatever, either from a chemical or physiological point of view, for presuming that we may expect any good result in practice from the employment of such a preparation.”
—*Pharm. Jour.*, Nov. 1856.

* Chemische Untersuchung des Penghawar Djambi in Vierteljahresschrift für prakt Pharmacie V. bd., 3 heft (1856).

† Since the above was in type, I have heard from my friend, Dr. J. E. De Vry, of Rotterdam, that the late Dr. Molkenboer, a talented Dutch physician, was firmly of the opinion that a decoction of *Penghawar Djambi* was beneficial in internal hæmorrhage.

PROCESS OF PRESERVING PLANTS IN THEIR ORDINARY FORM
AND WITH THE BRILLIANCY OF THEIR FLOWERS.

By. MM. REVEIL, Prof. to the School of Pharmacy of Paris, and BERJOT, Pharmacien at Caen.

It has long been a desideratum to preserve plants in such a way as to retain their natural form and appearance. Processes having this object have long since been described. We will take a rapid view of these processes, before describing that which we propose, and which we have always found successful.

In 1770, M. Quer, a Spaniard, presented to the Academy of Bologna a collection of plants, dried with care and very elegant; but in the process indicated the leaves and branches were detached, and dried separately between leaves of paper in the sun, or in a gently heated oven. The flowers retained their lustre and their form, if the desiccation was very rapid, and if very little pressure was employed; then the leaves and branches were again gummed on to the principal stem. It is easy to understand that this process must be very long, and that, moreover, it was difficult and even impossible to restore the leaves and branches to their natural position. M. Monty, who described this process in the *Observations sur la Physique et sur l'Histoire Naturelle*, 1772, page 623, ascertained that the temperature of the human body is the most suitable for this desiccation; it was by this means that he was enabled to preserve tulips, anemones, ranunculus, &c.

The celebrated anatomist, Ruisch, gives in his work entitled *Premier Tresor*, various processes for the preservation of animal matters, some of which may be applied to plants.

But it is especially to Monty that we owe the most interesting researches. We insert them here with so much the more pleasure, as his observations completely agree with our own; we did not know his works when we commenced our experiments; if we had known them some months ago, we should have been spared much trouble and many experiments.

M. Monty endeavored, in 1772, to preserve the plants without subjecting them to the least pressure; several attempts had been made in this direction; but fruitlessly. He first tried desiccation in millet seed; but he saw that by this means the flowers and leaves were wrinkled, and moreover, they retained the im-

pression of the millet seeds. He afterwards tried, with no greater success, millet deprived of its pericarp; rice and corn did not give any good result; every vegetable substance was rejected, because it took the moisture from the plants, and the desiccation was badly and slowly effected.

M. Monty then tried yellow river sand; he was obliged to give it up because the plants retained the sand. He was induced to make use of the white sand, known by the name of freestone (the sand of Etampes answers very well for this operation). After having sifted this sand in order to separate the coarser particles, he separated the finest particles by levigation, dried the sand and used it for enveloping the plants in boxes, which he afterwards exposed to the sun or to the heat of a baker's oven. The experiment succeeded very well; afterwards, Monty used sea-sand, which gave less satisfactory results.

Ten years ago, M. Stanislas Martin proposed, under the name of *embalment of plants*, a process of preservation, in which he likewise employed dry sand, but without pointing out the precautions to be taken, and without which the operation could not succeed.

Every one noticed at the Universal Exposition the magnificent flowers prepared by M. Keutz Swartz. We had an idea, at this time, to investigate the means by which these plants had been preserved. One of us possessing an apparatus in which a vacuum may easily be made, we tried desiccation out of contact with the air and at a low pressure, without obtaining very satisfactory results; we likewise tried the process by ventilation, which dries rapidly and perfectly preserves the color, but which has the serious inconvenience of deforming the corolla and mutilating the leaves; all the organs of plants become extremely friable by desiccation; thus ventilation had to be abandoned.

We then tried dry sand, and without being aware of M. Monty's experiments, we were led by degrees to introduce into the process the modifications which he had recommended as indispensable; that is to say, the selection of the sand in small equal grains, and washing it to remove the dust; but, in our opinion, these precautions are still insufficient, and after numerous trials, we have stopped at the following process:—

We take white sand in equal grains, which we pass through a

hair sieve, it is washed with a large quantity of water in order to remove the finer particles, and the washing is continued until the water goes perfectly limpid. The sand is then dried in the sun or in an oven, or, which is better still, it is raised to about 150° C. (302° F.), being kept constantly agitated in a basin. We then pour in for 25 kilogrammes of sand, a mixture of 20 grammes of stearic acid, and 20 grammes of spermaceti; it is mixed and bruised with the hand so as to cover every grain of sand with some of the grease.

We then put a layer of this sand into a box of any length and width, but of the height of about 12 centimetres (nearly five inches); the bottom of this box is let in by means of a groove, and should be capable of being easily removed. On the bottom is a grating of iron wire of very large mesh. The layer of sand being well established the plants are arranged in it, taking care to open the leaves and to mould the corolla in sand which is added with great care, the plants are covered with sand, and it is best to keep to this unique layer; we take care to put the least possible quantity of sand on the leaves and stems; we cover the box with a sheet of paper, and carry to a drying stove, or an oven heated to from 40° to 45° C. (104° to 113° F.); the desiccation proceeds very rapidly; when it is supposed to be finished, the bottom of the box is removed; the sand passes through the iron grating, and the plants remain; they are brushed with a badger hair-brush, and are kept as we shall presently direct.

The greased sand adheres very slightly to the plants, and it is always easy to remove it; it is often sufficient to give gentle blows for all the sand to fall, provided, however, that the plants have not been collected while still moist; we have likewise remarked, that it is better to collect them before the anthesis is completely operated; it may be finished by steeping the plant by its base into a small quantity of water; for rather fleshy plants, the vacuum singularly hastens desiccation.

However, we must add that sand, whether greased or not, cannot be employed for preserving plants which are covered with a viscid varnish, the hyoscyamus, for example; in this case it is absolutely necessary to use millet seed or rice, as Monty did.

We may, indeed, make two layers of plants; but it is not prudent to exceed that number. The box with a moveable bot-

tom, has rendered great services; in using an ordinary case, there is great danger of injuring the plants in removing them from the sand.

The brilliancy of the plants is quite retained by his process; white flowers even preserve their dead whiteness; it might have been feared that it would have been otherwise, since the white is the interposition of the air; yellow and blue flowers are preserved very well; but violet and red colors turn slightly deeper.

The dried plant, left in contact with the air, resumes a little moisture and withers; to preserve it, it is placed in bottles, at the bottom of which is put some quick lime enclosed in Japan paper and covered with moss; the bottle is hermetically sealed with a disc of glass, which is caused to adhere by means of a mastic of gum-lac, or caoutchouc.

This process of preserving plants may be of service for drying some flowers or plants used in medicine, such as the violet, the mallow, the stems of melissa, mint, hemlock, &c. The odor is very perfectly preserved and often increased, but it is especially for the preservation of plants intended for the Schools of Pharmacy and Medicine and for the Colleges, that this process may be useful; it will likewise render great services to horticulturists who desire to preserve rare flowers, as well as to travelling naturalists, who will thus be able to bring home their plants with their natural appearance, which will render determinations more easy.—*London Chemist*, October, 1856, from *Journal de Pharmacie*, August, 1856.

ADVANTAGEOUS PROCESS FOR THE PREPARATION OF LITHIA FROM LEPIDOLITE.

BY KARL VON HAUER.

Finely pounded lepidolite was well mixed with about half its weight of sulphate of lime, and exposed for two hours in a Hessian crucible to a red heat. On cooling, the mass, which was firmly caked together, but not fused, was lixiviated with hot water, and the solution separated from the insoluble residue by decantation. The solution contained nearly the whole of the potash, lithia and manganese contained in the lepidolite, converted into sulphates by the sulphate of lime. The solution also con-

tained a small quantity of alumina, and the proportion of sulphate of lime soluble in water.

The solution was evaporated to as small a volume as possible, as sulphate of lithia is very soluble in water. By this means a considerable portion of the much less soluble sulphate of potash crystallized out, as did also nearly all the sulphate of lime. The filtered fluid was mixed with ammonia, a little sulphuret of ammonium, and oxalate of ammonia. The precipitate thus produced, consisting of alumina, sulphuret of manganese and oxalate of lime, was separated, and all the lithia was then thrown down as carbonate, by means of carbonate of ammonia, assisted by heat, and washed with cold water. To purify it completely from potash, it is well to repeat the last operation once more, by dissolving the carbonate of lithia in an acid, and precipitating it again by carbonate of ammonia.—*Chem. Gazette*, Oct. 15, 1856, from *Journ. für Prakt. Chem.*

ON THE PREPARATION OF CHEMICALLY PURE SULPHURIC ACID.

By F. VORWERK.

Some time ago Russegger described a method in which, by a particular arrangement of the retorts, sulphuric acid may be distilled by boiling without thumping, and the rectification of the crude acid may be effected without the employment of platinum wire. Instead of this the author recommends the following process, which fulfils the same purpose, and dispenses with all further particular arrangements.

Into a long-necked plain retort, which had already served several times for the preparation of nitric acid, 5 lbs. of slightly brown English sulphuric acid, of spec. grav. 1.832 and free from arsenic, were put. The retort was put upon a layer of sand of the depth of a finger in the sand-bath, and surrounded with sand, so that it was buried up to the neck. A long-necked flask served as a receiver; it was simply pushed over the neck of the retort without any luting. Commencing with a moderate heat, this was gradually raised until the sand-bath became red-hot, during which the distillation went on quite regularly without any thumping. Notwithstanding the heat to which the retort was

exposed, the receiver did not require to be cooled until after six hours' working, and even then only by wrapping a wet cloth round the neck. The distillate was removed from time to time, and tested as to its purity and specific gravity. The first 5 oz. that passed had a specific gravity of 1.20, and exhibited no impurity except a considerable quantity of sulphurous acid. The second portion of $3\frac{1}{2}$ oz. of distillate, with a specific gravity of 1.75, still contained a trace of sulphurous acid. A third portion of $2\frac{1}{2}$ oz. was pure, and had a specific gravity of 1.850.

Fourth portion of $1\frac{1}{2}$ lb. spec. grav. 1.855

Fifth portion of 13 oz. spec. grav. 1.860

Sixth portion of 9 oz. spec. grav. 1.885

With this the distillation was concluded, to enable the contents of the retort to be examined. The uninjured retort contained the remainder of the sulphuric acid as a simple fluid with a white sediment (persulphate of iron,) from which no doubt $\frac{1}{2}$ lb. of pure distillate might still have been obtained.

In such distillation, particular attention is to be paid to the quality of the retort. It is always advisable to anneal the retort before using it, by heating it as strongly as possible in the sand bath, and letting it cool slowly and completely therein.—*Chem. Gaz.*, Nov. 15, 1856, from *Neues Jahrbuchr für. Pharm.*

ON THE PREPARATION OF DRYING OIL.

By PROF. R. WAGNER.

The author repeatedly prepared protoborate of manganese for lacquerers, in accordance with the directions of Barruel and Jean. He effected its precipitation whilst hot, and thus obtained it of a coffee-brown color, and consequently containing much oxide, but still always of remarkable efficacy. As, however, Barruel and Jean expressly observe that the action is proper to the protosalts, the author endeavored to obtain it perfectly free from oxide, and for this purpose effected the precipitation with borax cold. He obtained a snow-white powder, but this furnished no varnish. He therefore returned to the previous mode of preparation with the assistance of heat, and found that it was obtained of the darkest brown, and also of the strongest action,

when both the solutions of sulphate of manganese and borax were diluted as much as possible and mixed boiling. The siccative action upon the oil must therefore be ascribed to the oxide, and not to the protoxide.

By further experiments the author found that the boracic acid is quite superfluous, and that free oxide of manganese or its hydrate is as efficacious as the borate. The oil need only be heated for a very short time (about a quarter of an hour) with about one-eighth per cent. of oxide or hydrated oxide of manganese. The heat applied, need not approach the boiling-point by a long way; but no general temperature can be given, as new oil has a much higher boiling-point than old. The siccative quality, however, increases with the heat. But as the oil becomes darker and thicker in proportion to the heat to which it is exposed, it is the best plan in general to remove it from the fire as soon as it clears and begins to fume very slightly. Streaks of it now become firm in twenty-four hours. To obtain the drying oil of a very pale color, it must be heated still less. The drying is thus retarded several hours, but the color has scarcely become perceptibly brownish, whilst in the former case it always acquires a chestnut-brown color.

The author obtained a wine-yellow oil, quite unaltered, without heat, by mixing 1 per cent. of hydrated lime with a linseed-oil four years old, which dried by itself in three days. After being frequently stirred for two days, a streak of it was perfectly firm in twenty-four hours. Oil of the same year, however, did not become siccative even by boiling with lime.

The oil dissolves very little of the small quantity of oxide of manganese, and the salt, when removed, may be repeatedly used in the preparation of drying oil. When prepared oil is mixed with an equal weight of crude oil, it requires nearly twice as long to dry; with twice the quantity, twenty hours longer; and with three times the quantity, another twelve hours; but the time necessary for the solidification of the coating, gradually diminishes a little by long standing.—*Chem. Gaz.*, Nov. 15, 1856, from *Kunst-und Gewerbeblatt, für Bayern*.

NOTE ON A PRODUCTION OF SULPHURET OF IRON.

By M. CHEVREUL.

In a memoir which I read to the Academy in November, 1846, I examined the black ferruginous matter found under the pavements of Paris, and I arrived at the following conclusions:—

This matter proceeds from the horses' shoes, from the iron of the wheels of vehicles and from the *debris* of that metal which are scattered on the public way; it is carried into the gutters and between paving stones, and there it is converted into magnetic oxide of iron ($\text{FeO}^2 + \text{Fe}$) and may afterwards pass to the state of sulphuret, likewise black.

So long as the matter remains black, it prevents the oxygen of the atmosphere, whether in the gaseous state, or dissolved in water, from penetrating into the layer of earth situated beneath it.

How is this sulphuret of iron produced?

Experiment has taught me:—

1. That mixtures of iron and gypsum; of iron, gypsum and white of egg; and of iron, gypsum and gum arabic, confined in flasks with water and air, had given only oxide of iron without sulphuret.

2. That protosulphuret of iron was produced under a pavement near Bièvre, and in a place where there was water impregnated with organic matter and sulphate of lime, a portion of which had been converted into sulphuret.

I concluded from this double observation, that the sulphuret of iron which is found in the mud of Bièvre, &c., results probably from the reaction of the oxide, or sesquioxide of iron, or the sulphuret of calcium, produced by the reaction of the organic matters on the sulphate of lime.

The object of the note which I now communicate to the Academy, is to convert this probability into certainty. I have now profited by the cleansing of Bièvre to examine a black sandy mud, which was raised from the bottom of the river. On placing this mud on a filter, there passed off a yellow liquid, principally formed of a polysulphuret of calcium; it precipitated acetate of lead of a reddish-brown, and disengaged hydrosulphuric acid, depositing sulphur; it was sufficient to expose it to the air for it to become milky; finally, on agitating it with hydrated sesqui-

oxide of iron, it blackened this oxide, the water lost its sulphurous properties, and the black sulphuret treated with hydrochloric acid disengaged hydrosulphuric acid, leaving very finely divided sulphur undissolved.

I proved, besides, that the sand of the black mud, after having been washed with boiling water, and freed from all sulphuret of calcium, was colored by protosulphuret of iron, which disengaged hydrosulphuric acid when it was treated with hydrochloric acid.—*Chemist, Sept., from Comptes Rendus, July 21, 1856.*

ON THE TRANSFORMATIONS WHICH PROTOCHLORIDE OF MERCURY UNDERGOES UNDER THE INFLUENCE OF WATER, ALCOHOL AND HEAT.

BY M. BERTHE.

In this memoir the author arrives at the following conclusions:—

1. That under the influence of an elevation of temperature, and especially in contact with alcohol and water, the protochloride of mercury is decomposed, and gives rise to a certain quantity of bichloride.

2. That Smithson's battery, put in contact with calomel in suspension in water, gives rise to the same reaction, and that consequently, whenever we wish to free calomel from the bichloride which it may contain, or to detect the presence of this salt in it, we should employ the liquids, water, alcohol, or ether, only at the ordinary temperature; and that before resorting to the use of Smithson's battery, we should make sure of the perfect limpidness of the liquor.

3. Finally, in a physiological point of view, it may be deduced from these experiments that if a continued temperature of 40° to 50°C. (104° to 122°F.) is sufficient for causing the partial conversion of the protochloride of mercury into bichloride, it seems scarcely doubtful that this conversion is so much the more likely to be produced in the organism, when it is subjected to a temperature approaching that necessary for the transformation in presence of a relatively considerable quantity of alkaline chlorides. This is an additional proof in support of the opinion expressed by M. Mialhe, relative to the mode of action of this compound.—*Chemist, Sept., from Comptes Rendus, July 21, 1856.*

ON THE USE OF PLATINUM INSTEAD OF PORCELAIN OR GLASS
IN MARSH'S METHOD OF DETECTING ARSENIC.

BY EDMUND DAVY, F.R.S., M.R.I.A., F.C.S.L., &c.

Professor of Agricultural Chemistry to the Royal Dublin Society.

Marsh's method, as is well known, is founded on the facility with which hydrogen gas, generated in the usual way, reduces arsenious or arsenic acid, if present, forming arseniuretted hydrogen, which being inflamed in contact with air, deposits on particular surfaces the arsenic, either in the state of metal or oxide, or a mixture of both, according to circumstances.

Porcelain or glass surfaces have been generally recommended by chemists. I have seen no mention made of platinum. On lately trying surfaces of this metal, it appeared to me to offer peculiar advantages, and to be decidedly superior to either porcelain or glass. In my first experiment I used a slip of thin platinum foil, but there was no deposition on it; the flame, though small, produced sufficient heat to carry off all the arsenic as arsenious acid; but on trying the blade of a platinum spatula, a spot of arsenic was at once deposited on its surface (closely resembling that produced by my electro-chemical method of detecting arsenic by the agency of zinc and muriatic acid on platinum.) A number of similar spots may be produced at pleasure, by holding the spatula for successive instants very near the orifice of the tube delivering the gas, the flame being small; then the spots of arsenic appear to be in the metallic state, or only partially oxidated, and they adhere strongly to the spatula; but if the spatula be held a little further from the orifice, then only arsenious acid will be deposited on it. The heat of a candle is sufficient to volatilise the arsenic as arsenious acid from the spatula, and this effect is accompanied by the alliaceous odor, even when the quantity of arsenic is less than one thousandth part of a grain.

In cases when antimony is present in solution under similar circumstances, antimoniuretted hydrogen is produced, the flame of which occasions the depositions of blackish spots of antimony, which are not removed by the flame of a candle.

The advantages of the platinum surface over porcelain or glass appear to be pretty obvious. The former is more manageable for subsequent experiments. The arsenic strongly adheres to

platinum, but weakly to glass or porcelain, from which surfaces it is easily removed by the finger. It is readily sublimed, producing the garlic-like odor. There is no ambiguity in the results ; if antimony be present it remains fixed on the platinum. The apparatus I have employed is simple, a twelve ounce phial, with a mouth about an inch in diameter, having a tight cork, furnished with a funnel tube reaching nearly to its bottom, and a small tube drawn out to a point for the discharge of the gas. The zinc I employed was in the state of small lumps or in grains, and the sulphuric or muriatic acid very diluted, viz., one volume of acid to from 15 to 20, and even 25 volumes of water.—*Chem. ist*, Oct. 1856.

APPARATUS FOR TAKING SPECIFIC GRAVITY.

By MESSRS. ECKFELDT and DUBOIS.

From Proceedings of American Philosophical Society.

The apparatus for taking specific gravity of solids, is essentially a tin cup with a spout at the side. Five vessels are here shown, of different sizes and shapes, to suit different cases. Four of these are cylindrical, raging from six to ten inches high, and from two to five inches in diameter. The tall one (ten inches by two), is intended for the trial of silver spoons and forks, or articles of similar shape ; the others are adapted to lumps of stone or metal, or blocks of wood, of various sizes. The fifth vessel is rectangular, measuring $6\frac{1}{2}$ inches high, $1\frac{3}{4}$ inches long, and $\frac{1}{4}$ inch broad, being intended for coins, not smaller than the half eagle or quarter dollar, and for small medals and gems of admissible size. This vessel is provided with a brass plate, as a *plunger*, for diminishing the surface. The smaller vessels are set firmly in mahogany blocks, to insure steadiness in the operation ; and these blocks have screw feet, for convenience of leveling. The spouts extend upward, with a curve outward, the beak being far enough below the top of the cup to allow for the space to be taken up by the specimen, that it may not force the water over the top nor leave any point uncovered by water. The aperture of the spout is tapered to the one-sixteenth of an inch, and a small bit of wire projects downwards from the beak, to carry the drops of water properly. A small cup is placed directly under, to catch the water displaced, and a brass weight, equal

to the weight of this cup when empty, is found convenient (though not necessary) as a counter-weight.

When the operation is to be performed, suppose upon a gold or silver ore, the ore is first weighed, and afterwards its surface is moistened. The vessel is then nearly filled with water, and so much as is superfluous, or above the level of the beak of the spout, runs or drips off, to a final drop. The small cup is then set under the beak, and the lump is carefully lowered into the vessel by a hair wire or waxed thread. This, of course, displaces its own bulk of water, which runs off into the small cup, gradually coming back to the former level, by a final drop. The weight of this water is the divisor, the weight of the lump the dividend, and the quotient is the specific gravity.

In connection with this apparatus, the following miscellaneous remarks are offered to the Society.

The opening of the gold mines of California brought out a great number of beautiful specimens of gold in the matrix (or mingled with quartz) of the most fanciful forms, and every variety of size and value. In many cases it was presumed, by the holders of these prizes, that they would bring more money, as curiosities, than as bullion; and at any rate, very many owners were unwilling to have such attractive specimens spoiled until they had been sufficiently exhibited. At the same time, it was always desirable to know, pretty nearly, how much gold was actually contained; and, to obtain such estimates, upon what was supposed to be reliable authority, many of these specimens were brought to the assay office of the mint. They came at a time when we were overpowered with the legitimate business of the office, and yet it seemed impossible to refuse such requests; and, for a considerable time, such employment was interesting as a matter of scientific inquiry. Especially when we could compare our estimates with the more definite and accurate results obtained by putting specimens or "nuggets" through the regular routine of melting and assay. On one occasion a lump, weighing over 200 pounds, came to us for this purpose. It was sent by the Isthmus route, at a time when transportation was enormously dear, and having visible gold on the surface, was expected to be rich throughout the mass; and, with this expectation, was on the way to London, to make an impression upon the stock market

there. By the aids of a very large steelyard beam and copper kettle, we were enabled to take the specific gravity, but could not make it higher than that of compact quartz. The result seemed so questionable, that we obtained permission to break up the rock, and found that what little gold it contained was at the surface.

Not only were ores brought to us from California, to be estimated, but also from other mining regions, and of various metals; but chiefly gold and silver. As the specimens were of all sizes, these demands upon us often proved embarrassing, since it was necessary to have beams suited to them, and with attachments for weighing in water. We therefore had frequent recourse to the method advised by the elder Dr. Patterson (formerly President of this Society,) which consisted in using a jar or pitcher, rather larger than the specimen, and not over-large at the mouth; this was filled with water up to a marked line; and then, by introducing the specimen, and bringing back the water to the same line, so much water was removed as was just equal in bulk to the bulk of the specimen; the weight of this water gave the divisor, the weight of the specimen (taken while dry,) the dividend, and the quotient was the specific gravity.

The results thus obtained were, generally, as satisfactory as those by the usual method. And here it may be interesting to cite a few examples from our minutes, of specimens estimated by one or other of the processes mentioned, and afterwards melted down and assayed as regular deposits.

1. A lump of quartz, containing gold, found by two Mexicans of the "Sonorian camp," in California, weighed $265\frac{1}{2}$ ounces: assuming the quartz at the sp. gr. of 2.60, the amount of gold appeared by sp. gr. of the lump, to be $209\frac{1}{2}$ ounces; the actual amount was $211\frac{1}{8}$ ounces.—2. Another lump, where we assumed the matrix at 2.64, gave an estimate of $100\frac{1}{8}$ ounces of gold; the actual product was 100 1-10th ounces.—3. Four pebbles taken together, estimated at 77 ounces; actual content 76 8-10th ounces. And, lastly, a lump which had been bought in California for 800 dollars, and which weighed $408\frac{1}{2}$ ounces, gave an estimate of $89\frac{1}{2}$ ounces, or 1572 dollars, taking the matrix at 2.63; the actual yield was 91 2-10th ounces, or 1602 dollars; the fineness being 850 thousandths. In this case there was an error of

30 dollars, or about two per cent. upon the value ; an amount of error to which such specimens are liable, with any apparatus.

But it was obvious that the method of displacement required a series of vessels specially adapted to the operation, to complete with weighing in closeness of results. After a good deal of reflection and experimenting, in which many modifications of shape and arrangement were tried and discarded, and which it would be cumbersome to notice in this place, the apparatus now shown was found to answer best. In practice it is really a pleasant and satisfactory substitute for the tedious and irksome method usually resorted to. Some few precautions must, of course, be attended to. The vessel must stand firmly. If at first the water will not flow, or flows fitfully, the obstruction will be removed by blowing a little in the spout.

An investigation of some interest, growing out of this matter, may properly be noticed. Where we are operating on substances of low specific gravity, say wood or stone, a drop or two of water, or the size of the drop, in tapering off the divisor, is of no consequence. But it is otherwise in the case of a gold coin, for example :—in a double eagle, the difference of one drop of water (ordinary about a half-grain) in the divisor, would affect the result to the extent of 0.3, which carried into the fineness, would make a difference of 15 or 20 thousandths ; and in the case of a half-eagle, the uncertainty of result would be proportionally increased. The question then arose, what fluid, or what modification of water, will afford us a smaller drop ? for, as was just observed, a half-grain is, on the average, the smallest of clean water that will detach itself by its own weight. Very much depends, of course, upon the size of the aperture, in the measure of drops of fluid ; one drop of water from a large beak weighed $1\frac{1}{3}$ grains. In the Dispensatory of Drs. Wood and Bache, there is a table of the experimental results of Mr. Durand, showing the number of drops of different liquids equivalent to a fluidrachm (page 1405.) The differences are very remarkable ; distilled water, for instance, being set down at 45 drops, and pure alcohol at 138 drops. And in our own experiments, the drop of alcohol was about one-third the weight of the drop of water, from the same pipette. This seemed to point to alcohol as a substitute ;

but there were obvious objections, and a much better vehicle was found in *soapy water*.

The best white soap, sold at the shops, is of the same specific gravity as water, and its mixture with water makes no change, in that respect. When the mixture is as strong as children use for blowing bubbles (we cannot conveniently give this measure in figures,) the cohesion or tenacity of the water is so much weakened that the drop is reduced to one-tenth of a grain. No other fluid makes so small a drop as this. And there is the further advantage, that soapy water, though excellent for making bubbles, is less liable to retain them below the surface than pure water. So small a drop, of course, makes the experiment more tedious, and, by using less soap, the size of the drop will be, in many cases, advantageously increased.*—*Silliman's Journal*, Sept. 1856, from *Proc. Amer. Phil. Soc.*

Varieties.

Observations on the climates of California. By Mr. GEORGE BARTLETT, (from a letter dated Providence, June 27, 1856.)—The natural forces which produce the various meteorological phenomena of California, are much less numerous than in the eastern part of the continent, and act on a much larger scale, and they are therefore more easily understood. In fact, with a knowledge of three great causes, the peculiarities of the several climates of California would have been readily anticipated. These are; 1st, the cold ocean current which rolls along the coast from northwest to southeast; 2d, the direction of the winds; 3d, that property of air by which its capacity for containing moisture is increased with the elevation of its temperature. The ocean current will no doubt be thoroughly examined in the course of the Coast Survey. Dr. Gibbons, of San Francisco, ascertained at one time its temperature to be 54° Fahrenheit.

Now, during the summer months, as soon as the rays of the sun have warmed the air over the land, it becomes rarified, and the colder and heavier air rushes in under it from the ocean, producing that sea-breeze, which

*[NOTE.—An apparatus precisely similar in principle, but varied slightly in detail, was described and figured in the *Pharmaceutical Journal* for May 1856 by Mr. Stevenson. Instead of the open spout, a tube depressed at an angle furnished with a stop cock is used.—EDITOR AMER. JOUR. PHARM.]

lashes the coast of California with so remarkable regularity, almost every afternoon throughout the summer months, driving the sand through the air, and compelling people to put on over-coats and kindle fires, even under that cloudless sky and in those low latitudes. As this cold air from the ocean is warmed by the land, of course its capacity for holding moisture is increased, and instead of there being any tendency to form clouds and to to rain, it becomes a very drying air, absorbing water from everything that it touches. This is the very simple and plain explanation of the dry season.

The most wonderful phenomenon of the California climates, is the marked manner in which they are cut in two by no higher chain of mountains than the Coast Range. This range extends along the coast of California from latitude $34\frac{1}{2}$ to $41\frac{1}{2}$, and is so low, that snow collects during the winter only on a few of the highest peaks. Now, while the western side of this range has the cold summer above described, the valley on the east side is one of the hottest portions of the earth. This valley, through which flow, in opposite directions, the waters of the Sacramento and the San Joaquin, extends about 400 miles from north to south, with an average breadth of perhaps 60 miles, from the Coast Range on the west to the Sierra Nevada on the east. It is a very flat valley, much more level than the western prairies, and occupies the great portion of the interior of California. It has been quite difficult to obtain exposures of a thermometer which were unobjectional. In the cloth tents and stores which were in use in 1849 and '50, the temperature would range in the warm days from 115° to 120° . On the north side of a large tree, also in a wooden cabin covered with earth, a friend of the writer observed the mercury at 110° and 112° during many of the days of 1850. On the north side of a large two-story frame house, with but one other house near, and that one several rods distant, the writer has observed the mercury at 109° . But Dr. Haille at Marysville, by hanging his thermometer in a draft of air in the back part of his office, where it was shaded by high buildings around, succeeded in keeping the mercury down to 102° during the summer of 1852. The sun rises clear in the east, rolls up over the heads of the inhabitants, drying and scorching everything in sight, and sinks in the west—"One unclouded blaze of living light." And this is repeated day after day, and month after month. The hottest time of day is about half-past five in the afternoon. The nights are cool; you need two or three blankets to sleep comfortably even in the hottest part of the summer. A plate of butter set in a common wooden house, will be perfectly liquid at night, and entirely hard in the morning, and these changes will occur every twenty-four hours for months in succession.

The change from the cold climate of the coast to the heat of the valley is marvellous. You go on board a steamboat at San Francisco at four o'clock in the afternoon, and find the passengers all dressed in winter clothing, flannels and overcoats, huddled around the stove in the cabin with its hot anthracite fire. The next morning at sun-rise, you find

yourself going up the Sacramento river, and, as your state-room is insufferably hot, you put on the thinnest summer clothing, and go out on the guards of the boat, oppressed with the heat, and the perspiration starting from your pores.

There seems to be some doubt whether the great difference between the climate of the coast and that of the interior, is to be wholly attributed to the Coast Range. From Benicia this range trends inland, leaving quite a broad tract between it and the sea. On the east side of the bay of San Francisco, between the bay and the mountains, is a tract of level land, five to ten miles in width, of great fertility and which, in the month of May, is almost one unbroken field of waving grain. This plain is swept every afternoon in summer by the sea-breeze, and there is no doubt the breeze here is less violent and less cold than it is in San Francisco, though nothing intervenes but a smooth sheet of water.

This plain may be considered a portion of the valley of San José, which extends southerly from the neighborhood of San Francisco, some 70 or 80 miles, between the broken hills of the coast and the main ridge of the Coast Range. The valley, as well as others similarly situated, among the straggling ridges of the Coast Range, such as Nappa, Santa Cruz, San Pablo, &c., enjoys the most delightful climate in the world. The fierce gale which drives through the streets of San Francisco, is here tempered into a bland and bracing breeze. The malaria, so prevalent in the great valley of the interior, is here unknown. The husbandman reaps the abundant harvests of the fertile soil in *health* and *comfort*. For two months he reaps, leaving the grain in the fields, and for two months more he threshes and winnows, allowing the bags of grain to stand where they are filled, without the slightest apprehension of a shower. No thunder ever disturbs the serenity of the sky. These delicious valleys are indeed the Edens of the west.

Besides these three climates in California, that of the coast, that of the interior, and that of the small valleys which lie among the scattered branches of the Coast Range, there is yet a fourth, the climate of the mountains. But this, with the exception of its dry seasons, has merely the characteristics of other mountain climates, the heat decreasing with the altitude.

These are the summer climates. In the winter there is no perceptible difference in the weather throughout California, except the very small difference caused by the latitude, and the very great difference caused by the altitude. In the lowlands the climate is very similar to April in New England, or perhaps it may be more nearly compared to our spring, from the middle of March to the middle of May. There is no snow, though frosts are frequent. Near San Francisco, peas are planted in October, and strawberries are to be had every day in the year. Still, ice has been known to form half an inch thick in one night. On the mountains, snow falls to a great depth. Indeed, the stories which are told of its depth

are incredible, many persons having assured the writer that it would average ten feet. Nearly all the rains are with the wind from the south, probably caused by the simple cooling of the air in moving from a lower to a higher latitude. Occasionally, about once in a season, there is a rain with the wind from the north. The climate is remarkably serene. There are very few gales or high winds. In the winter it is generally calm. In the summer, in the interior, there is generally a very mild breeze, more than half of the time from the south; and, very unaccountably, the wind from this direction is generally cooler than the wind from the northwest. Probably the reason why there is no thunder and lightning, or so little, is, that there are no showers or clouds in the summer. That the sea breeze, with its accompanying dryness, does not continue through the winter, is probably attributable to the diminished force of the sun's rays in his withdrawal to the south.—*American Journ. of Science and Arts*, Sept., 1856.

On a Cause of Atmospheric Electricity.—There exists between the living plant and the soil supporting it an electric current, which always moves in the same direction, that is, the soil is constantly positive, the plant continually negative. This fact was first observed by M. Becquerel, Sr., and for several years it has been pointed out by him as one of the causes of atmospheric electricity. On repeating the experiments a year since, he was struck with the anomalies presented in operating on the bank of a stream, in the water, and also at a certain distance from the plant, and was thus led to study the effects under these circumstances. These effects are complex and change their direction and intensity with the chemical composition of the water and the soil. In each case the results depend on heterogeneity between the water and the soil; alkaline waters are negative, and acid waters positive; it follows therefore, that sometimes the effects are null, as happens on the waters of a river and along the sandy banks washed by the floods.—*Ibid.*

Fecula of the Horse-chestnut.—Among the products in the Agricultural Exhibition, the different kinds of fecula were of prominent interest, and especially the fecula of the horse-chestnut (*Æsculus hippocastanum*). The exhibitor of it, M. Callias, has been honored with the silver medal, because of the simple and economical method of extraction which he has brought into use, permitting the fecula to be sold 25 to 30 per cent. less than other related products.

This fecula has been many times commended to attention since Bachelier in 1615 brought the tree from Constantinople, (it coming originally from Southern Asia). Parmentier, Beaumé and others sought successively to bring it into general use. But the mode of manufacture was not satis-

factory, partly because of the presence of a resinous substance which was separated with difficulty, and partly on account of the dark shell of the nut, which it was thought necessary to remove before extracting the fecula.

In the new process, the nuts are grated with the bark on, and treated like the potato with its skin; the material is then washed in water as easily and as economically as the potato, so that the price is not above 20 centimes per kilogramme, the cost of cultivation and manufacture being included. 20,000 kilogrammes of the fecula manufactured this year with the apparatus that is used for the potato have settled the question of its importance.—*Ibid.*

Gura Nut of Africa.—The gura nut is a species of large red bean, of a bitter taste, but greatly prized for its tonic properties. It grows on a tree resembling somewhat the magnolia, and is to be found only along the sea coast regions. The tree bears a large number of pods, in appearance and size not unlike a cucumber. Each of these pods contains a half dozen or more of these irregular-shaped beans. They are greatly prized by the interior nations, and especially by travellers, who have to perform long journeys, and many times without sufficient food.—*The Medical World*, Dec., 1856.

Families of Insects.—A celebrated entomologist says, that more than a lifetime would be necessary to enumerate the various species of insects and describe their appearance. Meiger, a German, collected and described 600 species of flies, which he collected in a distance of ten miles circumference. There have been collected in Europe 20,000 species of insects preying on wheat. In Berlin, two professors are engaged in collecting, observing, and describing insects and their habits, and already they have published five large volumes upon the insects which attack forest trees.—*Ibid.*

Raising Opium in Alabama.—A writer proposes the attempt of raising the large white poppy in that State, and thinks the manufacture of opium would be a profitable enterprise. Children and females could manage a good part of the labor, which is a light and agreeable occupation.

The climate is unquestionably favorable to a strong growth. Vast fields of poppies are grown in Belgium and some parts of France, not for the opium, however, but for the oil, extracted from the seed, which is used with white lead or zinc, for producing a beautiful white paint that does not turn yellow, like linseed oil exposed to light.

Just at sundown, those having care of the opium poppies, make several slight cuts lengthwise on the seed bulb, before they become ripe. A milky juice immediately exudes, which thickens in the sun next morning, and is

then scraped off. This product is pure opium. Any one of the Southern States in which cotton is grown, might produce an opium crop, annually, for exportation, that would yield an immense revenue.—*Ibid.*

Exploration of the Nile.—The new expedition to the head waters of the Nile, under the command of the French Count d'Escayrac de Lauture, and under the protection and auspices of Said Pasha, promises to exceed all other similar projects hitherto set on foot. At Vienna, twelve officers of the Austrian general staff expressed their willingness to join the expedition, from which number three were selected, who, together with the mineralogist, Mayer, recently in the service of the Dutch government in Borneo, make up the complement of Germans in the expedition. The whole force will comprise twelve Europeans, besides the leader, and three hundred soldiers furnished by the Egyptian government. Among these latter, who are principally natives of the interior of Africa, there is supposed to be a sufficiency of interpreters. For the navigation of the Nile, the expedition has thirty barks and two small steamers, and one hundred men, besides the necessary men and means to continue the journey by and beyond the head of navigation. Never before was an expedition fitted out in like manner.

Much is expected from the medical gentlemen in the expedition. They were to have left Europe on the 10th of September,—and it is therefore presumed they are on the way—Count d'Escayrac with the Germans embarking at Trieste, and the French expeditionists at Marseilles. The entire party will meet at Alexandria, and expect to reach Chartoum by December, where they will remain some time to complete the organization.—*Ibid.*, Oct., 1856.

Bookworms.—In paper, leather, and parchment, are found various animals, popularly known as “bookworms.” The larvæ of *Crambus pinguinalis* will establish themselves upon the binding of a book, and, spinning a robe, will do it little injury. A mite (*Acarus eruditus*) eats the paste that fastens the paper over the edges of the binding, and so loosens it. The caterpillar of another little moth takes its station in damp old books, between the leaves, and there commits great ravages. The little boring wood beetle also attacks books, and will even bore through several volumes. An instance is mentioned of 27 folio volumes being perforated, in a straight line, by the same insect, in such a manner that, by passing a cord through the perfect round hole made by it, the 27 volumes could be raised at once. The wood beetle also destroys prints and drawings, whether framed or kept in a portfolio. The “death watch” is likewise accused of being a depredator of books. These details were collected by the experienced keeper of the Ashmolean Museum at Oxford, in 1841.—*Ibid.*

Scientific Merit.—The Copley Medal, of the past year, has been awarded to Prof. Milne Edwards, of Paris, for his brilliant researches in comparative anatomy and zoology. Another to Prof. W. Thomson, of Glasgow, Scotland, for his various physical researches relating to electricity, in reference to the motive power of heat. Prof. Louis Pasteur, of Lille, had the Rumford medal for his discovery of the nature of *racemic* acid and its relation to polarized light.—*Ibid.*, Jan., 1857.

Safety Lucifer Matches.—The safety lucifer match is the invention of Lundstrom, a Swede, who has a large match manufactory at Jonkoping, in Sweden, where some hundred workmen are employed, and eight or more millions of matches are produced daily. They are about to be introduced into this country by the firm of Bryant & May, London, who are the largest importers of German and Swedish lucifers in the kingdom. A patent has been taken out in their name for the sale in England of the Swedishmatch. Its peculiarity consists in the division of the combustible ingredients of the lucifer between the match and the friction paper. In the ordinary lucifer, the phosphorus, the sulphur, and chlorate of potash or nitre, are all together on the match, which ignites when rubbed against any rough surface. In the Swedish matches these materials are so divided that the phosphorus (which is employed solely in the amorphous state,) is placed on the sand-paper, whilst the sulphur, and a minimum amount of chlorate or nitrate of potash, is placed on the match. In virtue of this arrangement, it is only when the phosphorized sand-paper and the sulphurized match come in contact with each other that the ignition occurs. Neither match nor sand-paper, singly, takes fire by moderate friction against a rough surface. The matches are thus much less liable to cause accident by casual ignition than the ordinary ones; and the recent edict by the Spanish Government against the employment of lucifers by the peasantry of the forest districts in dry weather (which will certainly be evaded) would be needless, if the Swedish matches were in general use. If they fully answer the announcements of the inventor, and it is due to him to acknowledge that they excited great interest at the exhibition in Paris last summer, they will soon displace the common lucifer, in virtue alike of their manufacture being much less injurious to the health of the workmen who make them, and to the property of those who use them.—*Journ. Franklin Institute*, Jan., 1857, from *The Lond. Journ. of the Society of Arts*, No. 194.

An Ice Machine has been completed at Cleveland, Ohio, which is capable of producing one ton of solid crystal ice in twenty hours. A trial has recently been made with the above result, while the mercury stood at 80° in the apartment. The estimated expense of manufacturing ice by such a machine is \$5 per ton, or one-fourth of a cent per pound.—*The Medical World*.

For the Hair.

Castor oil	.	.	.	.	2½ lbs.
Strongest alcohol	.	.	.	.	2½ pints.
Pulv. cantharides	.	.	.	.	½ oz.
Oil bergamot	.	.	.	.	2½ oz.
Otto of roses	.	.	.	.	20 gtt.

M. Let them stand for a few days and filter.

Superior for keeping the hair from falling, and preventing dandruff.—*Druggist's Circular*.

Artificial Meerschaum. By L. WAGENMANN.—If carbonate of magnesia be mixed with an eighth of its weight of calcined magnesia, and a little paste of lime obtained from calcined marble and solution of soluble glass added to it, the mass, after complete drying, is not unlike meerschaum, and may find employment in the arts. The alkaline salt produced is extracted by water from the dry meerschaum, which is then boiled with wax.—*Lond. Chem. Gaz., from Journ. für Prakt. Chem., lxxii. p. 502.*

Purification of Commercial Oleic Acid. By G. W. F.—Oleic Acid, which is procured in the manufacture of Spermaceti, &c., has lately come into use as a medicinal agent, on account of its power of dissolving other substances, used for external purposes; but as we find it in commerce it is not pure enough, containing in particular a surplus of sulphuric acid. To purify this commercial Oleic Acid, we dissolve it in as large a quantity of cold rectified alcohol, as it will absorb, and allow the solution to stand quietly for several days, during which a tallow-like substance is deposited. This is immersed in a large quantity of clean water; the particles of oil, which float on the diluted alcohol, are removed, and the whole again well shaken after a little more water has been added. Now filter the whole through white paper.

The alcohol may be purified again by agitating with charcoal or by distillation.—*Druggists' Circular*.

Fragrant Tincture of Myrrh for the Teeth and Gums.

Displace 1 lb. powdered orris root, with 5 galls. best alcohol, add 2½ lbs. small light colored tears of myrrh, bruised in a *Wedgewood mortar*. Let them stand a week, shaking often, then pour off clear, and add

Otto roses	.	.	.	½ oz.
Oil bergamot	.	.	.	1 oz.
Oil cassia	.	.	.	½ drachm.
Oil cloves	.	.	.	10 gtt. And filter.

Age improves it very much.—*Ibid.*

Deodorizing Tanks.—The Town Council of Glasgow have recently constructed some tanks for purifying water, and a chemist has since been appointed to advise the sanitary committee in making the necessary experiments. The council have now three tanks, 60 feet in diameter and six deep, with a mixing well 10 feet in diameter, an engine of eight-horse power, and a pump capable of raising 1,000 gallons in a minute, the calculation being that these tanks are quite capable of purifying the whole of the Pinkston Burn. The cost is £750, but that includes £195, for which sum the contractors have engaged to work the engine for three months, or £250 if for six months. At Mr. Wickstead's works in the neighborhood of Leicester, the deoderant used is lime, the process precipitation. It is thus described:—The whole of the sewage mater, including the refuse from dyers and scourers, is brought by the main sewers of the town to the works at the outfall, and in its passage to the reservoir the proper proportion of cream of lime is pumped into the pipe through which the sewage water passes. It is then passed through agitators before entrance into the reservoir, and when admitted, the solid matter begins to precipitate immediately, while the sewage water, thus gradually freed from impurities, flows into the river in a disinfected state at the further end of the reservoir. From the beginning to the end of the works no unpleasant smell whatever was perceivable, although the subsiding tanks, and all the processes mentioned are in the covered part of the buildings. The deoderization is complete.—*Ibid.*

Acetic Acid in Emulsions with Borax. Translated by GEO. W. FENNER.—It is a well known fact, that when Borax is added to a mucilage, it soon thickens, so that, if the quantity of Borax be large, a compact mass even is formed. Such mucilages and emulsions with borax being frequently prescribed by physicians, Dr. Geisler has made a long series of experiments to overcome this difficulty, and, according to the Archives of Pharmacy, vol. 87, p. 196, has at length completely succeeded. He puts into the liquid with which the emulsion, &c., is made, a few drops of diluted acetic acid, adding the pulverized borax after the emulsion is formed. This is a perfect remedy for the difficulty complained of.—*Druggist's Circular.*

Testing of Woollen Tissues for intermixed Cotton. By DR. A. OVERBECK.—The tissue is laid in a solution of 1 part of alloxantine in 10 parts of water, pressed and dried. This process is repeated twice. It is then exposed to dry vapors of ammonia, and washed with distilled water. The woolly fibres are now permanently dyed crimson; the cotton fibres remain colorless.—*Chem. Gaz., from Archiv der Pharm.*

Editorial Department.

FATAL CASES OF POISONING; PHARMACEUTICAL CARELESSNESS.—Within the last two or three years the deaths by poisoning, accidental and designed have been unusually numerous. Hardly a Medical or Pharmaceutical journal comes to hand, but presents some account of such catastrophes. These cases may be divided into three classes;—1st, *accidental* poisoning; 2d, intentional *suicidal* poisoning; 3d, and intentional *murderous* poisoning. Of the latter class the celebrated case of PALMER in England, who victimized friends and relations for lucre merely, is one of the most extraordinary. Domestic troubles, taking their origin in ill-assorted marriages, are a fruitful source of both murderous and suicidal poisoning;—and occasionally revenge for real or fancied wrong has resorted to poison as the agent for its gratification. In cases of this character, pharmacutists are rarely implicated, further than is occasioned by the laxity of law and custom in reference to the sale of poisons, which under plea of use for vermin may be obtained with comparative readiness. But a few days since, the papers recorded an instance where a man poisoned himself and family by putting a shilling's worth of arsenic in the morning coffee, resulting in the death of three. Poison bought for vermin is carelessly left in a position where it gets accidentally admixed in food, death ensues, and occasions but a passing remark from the editor who records the occurrence. When, however, through the agency of an apothecary, poisoning ensues, that *public opinion*, so lenient in the former case, rises up in judgment upon the delinquent, and sometimes consigns him to the prison, as has occurred recently in England. Why is this? Because the community repose confidence in the apothecary as a conservator of the public health, and expect him to possess those qualifications, natural and educational, requisite to carry out the important duties of his profession.

Pharmacutists are, however, made of the same materials as other men—the same deficiencies of education—the same variations of the intellectual and moral faculties. Nature makes no special class designed to fulfil the onerous and responsible duties of pharmacy with unerring certainty. In order that posterity may have those duties performed, it is necessary that *boys*, (and girls too, if these are to be employed as pharmaceutical assistants) in this generation, should be taught them, and to be able to learn, they must be afforded the opportunity to practice at the counter. But it should be under the *surveillance of qualified persons*. To expect more than this in the present unprotected condition of pharmacy is like expecting people to be expert swimmers before they go in the water! Some cannot learn to swim even with the latter privilege, and so some men can never become expert and reliable pharmacutists, owing to natural deficiencies and want

of early training. Yet such imperfect members of the profession, however much they may have mistaken their calling, must live by the pestle and mortar, and from time to time they break in on the monotony of their existence by an error of ignorance or negligence that wakes up the public mind to a state of nervous timidity and renders every disciple of GALEN an object of undefined suspicion. The public sentiment, however, soon relapses again into indifference and forgetfulness, without resorting to any wise precautionary legislation, calculated to give a proper status to the pharmacist, based on an adequate legal protection of the practice of pharmacy from unprincipled competition, and requiring that all who dispense medicines shall be properly prepared for it by a special practical and theoretical education.

These remarks have been called forth by recent occurrences in this city and Baltimore, which resulted in the death of three individuals, and in reference to which some comment seems called for in this journal, to point a caution to its readers.

About the beginning of January, 1857, an English lady called at the counter of a prominent pharmacist in Philadelphia, and asked the proprietor if he could furnish some "black draught," a solution of senna, salts, etc., better known in England than the U. States. She was told that it could be prepared for her and sent, which was accordingly done. A few days afterwards, needing more of the medicine, she sent her son to get a blue pill, some tamarinds, and to have the "draught" renewed, presenting the labelled vial in which the first draught had been contained. A female assistant in the store received the order, put into the vial an ounce of *Black Drop*, and, without changing the label, or signifying to the messenger its poisonous nature, sent it away. The vial was subsequently placed by the bedside of the lady, for whom it was procured, that she might take it early in the morning.

Some time after the family had arisen, attention was attracted to the lady by her stertorous breathing. The vial was examined and found empty, it was returned to the apothecary, to query if it was correct, and was pronounced all right. The physician of the family being sent for diagnosed cerebral congestion from apoplexy, or a narcotic poison. The message from the apothecary contradicted the latter idea, and before any efficient measures were taken, the patient succumbed. On subsequently again applying to the apothecary he found that an error had been made.*

The immediate cause of error in this instance was either carelessness from want of proper training, or it was gross ignorance. If it be admitted that the assistant understood the messenger to say "Black Drop," which is very probable, especially as the price charged indicated it, then why did she

* Since the above was in print, we learn from the "Public Ledger" of Feb. 24th, 1857, that the Coroner's jury has rendered a verdict in accordance with the above facts.

not label the vial, knowing it to be a deleterious preparation, and one that should never be sold without the assurance of correctness, unless ordered by prescription. The most charitable view is, that the messenger was understood to say "Black Drop," and that the label, by a hasty glance, was read "Black Drop," (when it was "Black Draught,") and was so dispensed. If this view is abandoned, and the occurrence attributed to ignorance in identifying the shop bottle, why was the high price of black drop charged for the preparation of senna intended? Such errors are liable to occur in any store where a part of the duties are executed by beginners, unless the all-important maxims for regulating extemporaneous pharmacy are early and constantly instilled into the apprentice during his novitiate, until they become by habit a second nature. Until this period arrives, the qualified assistant or proprietor cannot be too constantly watchful over the transactions of the junior. Some of these maxims are the following:

1st. Never permit any medicine to leave the shop without an appropriate label. (Had the vial been sent properly labelled with the direction for use that always accompanies it, there are nine chances to one that its nature would have been detected in time to have prevented the catastrophe.)

2d. Cultivate a habit of close attention when receiving a message, and understand it clearly, before giving ear to a second applicant.

3d. Never dispense any active or poisonous medicine, whether by prescription or otherwise, without recurring mentally to the question, "*Is it right?*"

4th. When a written order is not presented, it should be a uniform custom to get the demand repeated by putting a question, thus: "Did you say an ounce of *Black Drop*?" or, "*Laudanum* did you say?" or, "What did you ask for?" In this way, by giving very little trouble to the customer, the apothecary may have a check on error which will rarely fail, and which by long practice, we can recommend as a simple and safe expedient. There are names which, though spelled differently, have an analogy in sound, and the case in question is an instance of this, where the "a" in the last word is accented as the "a" in "awful" or "haul." We have repeatedly noticed instances of this kind.

5th. There is another precaution which may be adopted in every store with advantage; it is the German custom of putting the sign †, under or above the label of every poisonous substance; a black cross for mineral poisons, and a red one for vegetable or organic poisons. This sign has the force of a suggestive check to the apothecary himself, whilst the customer has no such impression created as would be caused by the word "Poison" on a bottle out of which his medicine was being taken. Besides, if the beginner is at once told the meaning of the sign, it will be a caution he can understand without further teaching, that will lead him to be careful whenever he handles bottles so marked.

Lastly. We may appropriately here repeat the often reiterated suggestion that in dispensing medicines from shop bottles, the apothecary should

compel himself to a habit of looking at each label before taking the medicine from it. In this way grave errors are constantly avoided in prescriptions where similar looking substances, like tartar-emetic and saltpetre, are being introduced, the one by grains and the other by drachms, by preventing the substitution of one for the other.

The second case of poisoning, in Baltimore, was of a different character, and appears to have been the result of carelessness in labelling a shop bottle containing granulated cyanide of potassium with the label *Kali Chlor*: which may mean Chlorate of Potassa, or Chloride of Potassium. The following report of a committee of the Maryland College of Pharmacy in reference to this case, will explain it to the reader.

"THE RECENT FATAL CASE OF POISONING.—At a late meeting of the Board of Trustees of the Maryland College of Pharmacy, a committee was appointed to investigate the circumstance attending the fatal mistake recently made by an apothecary of this city, and directed to make a report to the College at its next meeting. A special meeting of the College was held on the 30th inst., when the committee made the following report: The committee appointed to investigate and report upon the late lamentable cases of poisoning in this city from the use of Cyanide of Potassium, respectfully submit the following, viz:

That they have given the subject a thorough examination, and after comparing all the facts obtained from the physicians, coroner and others, as well as from their own observations, have come to the conclusion that the apothecary alone was responsible for the mistake, but are unable to account how any one with the proper qualifications of a Pharmaceutist could have made so fatal an error.

We found the bottle, the contents of which it is supposed were taken to compound the prescription, to have upon it two written labels, one pasted over the other. The under one was indistinct, but appears to have originally been *Kali Chlor*, afterwards altered by writing over it *Kali Cyanid*, the term generally used by German pharmaceutists for Cyanide of Potassium. The outer label was in the hand writing of the deceased, Chloride of Potassium, but the salt remaining in the bottle bears unmistakeable evidence of being granulated Cyanide of Potassium, one of the most deadly poisons known in Pharmacy.

The prescription of Dr. Arnold, plainly written, is as follows:

Potass. Chlor., 2 scruples.

Mel Scillæ, { each 4 drachms.

Syr. Lemon, }

Aqua Anis. dil. 1½ ounces.

The original prescription, the phial containing part of the medicine compounded by the apothecary, and the bottle containing a portion of Cyanide of Potassium, are now in the possession of the Maryland College of Pharmacy.

GEO. W. ANDREWS,

A. P. SHARP,

L. PHILLIPS,

Committee.

Baltimore, Jan. 30, 1857.

After the adoption of the above report, Mr. I. J. Graham offered the following resolution, which was concurred in:

Resolved, That although we regret deeply the occurrence by which either through ignorance or carelessness, or both combined, there was administered to the child of a citizen, an active poisonous compound in the place of a comparatively inert preparation, resulting fatally both to the child and the druggist who compounded the mixture; we feel it incumbent on us to make known to the public that the agent through whom this direful result was brought about, was in no manner connected with the Maryland College of Pharmacy."

From the newspaper accounts of the occurrence it appears that after the

death of the child for whom the mixture was prescribed, the bottle was taken to the apothecary with the information, when he immediately swallowed some of it, to show his confidence in its correctness, from which dose death ensued. The deceased appears to have been but little known and not long in possession of the store in which the mistake was made. What his claims really were to pharmaceutical education are not known; but from the books found in his possession it might be inferred that he was not uneducated.

It is highly probable that he found the bottle mislabelled when he came into possession of the store, and as Chlorate of Potassa or Chloride of Potassium are neither of them much called for, he may never before have had occasion to use the fatal bottle. Chloride of Potassium is frequently seen in a form closely resembling granulated Cyanide of Potassium, but *Chlorate* of Potassa is always in crystals, and as that was most probably the salt intended, it shows the importance of physicians being more explicit in prescription writing. It is possible that in this instance that the result might have been different had the name been written "*R Potassæ Chloratis ʒij*"; but be that as it may, the occurrence points to the danger of trusting to mere labels, without a corresponding knowledge of the substance labelled, and especially to the necessity of great caution regarding the contents of bottles in purchasing second hand stores.

IODINE WATER.—The proprietors of a preparation with this name have sent us a bottle. They claim it to be a solution of pure iodine in water *without any solvent (!)* to the extent of from one-half to three-quarters of a grain per fluid ounce. Dr. Chilton certifies to the solution containing about half a grain to the fluid ounce. A fluid ounce of the specimen sent to us, however, when treated with pure liquor potassæ, *diluted* to hundredths, was found to be decolorized and rendered insensible to starch paper by .06 grain of potassa, which is equivalent to less than one-sixth of a grain of iodine; but as the specimen tried had been kept some time in a warm room it may have lost strength. Admitting the presence of the amount of iodine averred, it is most probably held in solution by traces of hydriodic acid, and not by *pure* water. It is not, however, with the strength of the solution we have to do, so much as with the presumption and effrontery which in view of its actual composition could induce the proprietors to assert that "*ANDA'S LIQUID IODINE has demonstrated itself to be a complete and certain cure for consumption, palsy, rheumatism, scrofula, liver complaints, heart diseases, and disorders arising from impurities of the blood. IT ALWAYS EFFECTS A CURE,*" &c., (Druggists' Circular, page 16). The absurdity of supposing that this solution has more merit than Lugol's solution, equally diluted, is too marked to deceive any but the unprofessional, at the same time there *may* be a decided advantage in administering iodine in this very dilute form, patients often being very careless in the preparation of the ordinary tinctures or solutions preparatory to swallowing them, as regards proper dilution.

Whilst on this subject we will remark that physicians occasionally, by the careless association of acid substances with iodide of potassium give their patients unintentionally iodine in a free state. This is often done by prescribing sweet spirit of nitre with iodide of potassium. It is true that this spirit *ought* to be free from acid, but where it is neutral in one instance, it is acid in twenty, to a greater or less degree, and it is only when kept standing on some antacid salt like crystals of bicarbonate of potassa, as suggested by Mr. Harvey, (see U. S. Disp.) that it is always in a state fit for this use. Pharmacutists will find it convenient to adopt this method of keeping a portion of sweet spirit of nitre in a neutral state as, however free from acid the preparation may be when made, it tends to eliminate free acid in the frequently opened shop bottle. When this free acid is acetic, derived from the oxidation of aldehyde, the change in the iodide of potassium is not at first perceptible; it merely produces acetate of potassa and hydriodic acid; but gradually this acid, in contact with the air, is decomposed with the formation of water and free iodine. When the acidity of the spirit is due to either of the nitrogen acids, there is an instantaneous development of free iodine.

The American Druggists' Circular and Chemical Gazette.—Two numbers of this monthly periodical have reached us. It is published by Bridgman & Co., Druggists, New York, and edited by Henry Bridgman. Each regular number consist of a sheet in eight pages, four columns each, in a type neat and comprehensive.

The "Druggists' Circular" claims to be "A practical Journal of chemistry as applied to pharmacy, arts and sciences, and general business organ for druggists, chemists, and apothecaries." Its general aspect is that of a newspaper uncommonly well printed. The proprietors address it specially to business men, and believe that it will prove a valuable medium for gaining and communicating information, and particularly for advertisements. What the tone of this Journal is to be cannot, perhaps, yet be determined, but we trust that it will be an advocate of correct practice, sustain the Drug Law, and oppose the torrent of quackery, professional and popular, which is now so rife.

Researches on the Ammonia-cobalt Bases. By WOLCOTT GIBBS and FREDERICK AUG. GENTH. Washington City: published by the Smithsonian Institute, Dec., 1856, pp. 67. Quarto. (From Dr. Genth.)

The complex and interesting researches of Prof. Gibbs and Dr. Genth have been fittingly presented to the scientific world, under the auspices of the Smithsonian Institute. The true nature of the changes which ammonia cobaltic salts undergo by the action of oxygen, was not understood until Dr. Genth commenced his investigation in 1847, and published his first memoir in 1851 when in Germany. Since that time they have attracted

the attention of several chemists, and among others Prof. Gibbs, who in 1852 discovered a new class of these salts. As some of the discoveries of Dr. Genth have been described by Fremy as his own, two years after their announcement, it is presumable that this valuable monograph will place Dr. Genth's claims in the right light. We observe that the crystallo-metric determinations are by Prof. Dana of Yale College.

Nouveau Procédé de Dosage de l'Acide Carbonique dans les eaux Minérales suivie de Considerations sur la Constitution des eaux de Vichy. Par M. HENRI BUIGNET. Paris, 1856. Pp. 14. (From the author.)

This process of M. Buignet, late Secretary to the Society of Pharmacy, was read to the Académie Imperiale de Médecine, Sept. 9th, 1856, and is based on the fact that gaseous mineral water placed in a barometric vacuum gives out its gaseous contents, the amount of which is ascertained by the depression of the mercury, corrected for pressure, temperature, etc.

The utility of Colleges of Pharmacy: An Introductory Lecture. By Dr. LEWIS H. SREINER, Prof. of Chemistry in the Maryland College of Pharmacy.

We have been gratified by the perusal of Dr. Steiner's lecture, as published in the American Medical Monthly for February. Space will not admit, or we could present our readers with some of the arguments brought forward to prove how Colleges of Pharmacy "can be useful and protective to the apothecary, the medical profession, and the community at large," but we cannot withhold the following paragraph addressed to the student himself:

"We can thus sum up the utility of the college as consisting in the presentation of the surest and swiftest method of gaining a knowledge of Pharmacy, in clothing this knowledge in an attractive form,—bringing out the most important points for the student's notice,—and in giving him a connected view of the relations of the whole subject, which require his attention. If the instructors in such an institution are enthusiastic in their vocation, honest and true to their duties, all these ends will be obtained. But besides these, who does not know the value of system in study, and of the assignment of a certain hour to certain duties; and still more the importance of bringing those together who are prosecuting similar investigations, and causing mind to brighten by collision with fellow mind? This itself is of no small benefit. The youth feels the stimulus of laudable ambition, and enters with a generous and honorable rivalry into the field with his brethren. He lags not by the wayside, for he does not want to be recognized as inferior in abilities and diligence to his companions. Thus mutual emulation acts as the spur to the indolent, and a noble impulse to the industrious. If engaged in private study in the shop, he may easily be persuaded to relinquish his task for some other attraction, and no one will readily detect his negligence; but if this is done here, the contrast is seen at once and odium rests upon him for it,—not only for the present but odium of that character which requires years utterly to eradicate."

The publication of this lecture in a Medical Journal where it will meet the eyes of physicians will add much to its usefulness.

THE
AMERICAN JOURNAL OF PHARMACY.

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MAY, 1857.  
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OLEUM ÆTHEREUM AND SPIRITUS ÆTHERIS COMPOSITUS.

By EDWARD R. SQUIBB, M. D., U. S. Navy.

Assistant Director U. S. Naval Laboratory.

In using the U. S. officinal formula for ethereal oil some years ago (1853) for the first time, six charges of a large glass retort were worked off, each charge containing three times the quantity prescribed in the formula. Three of these charges were managed in strict accordance with the directions of the Pharmacopœia, and three without the prolonged contact of the materials. In the first three the oily stratum was underneath and measured $3\frac{5}{8}$ f.℥. This yielded 841 grains of finished oil of s. g. of 1.129 at 70°.

In the last three the oily stratum was uppermost in the receiver, as indicated in the officinal formulæ. It was of a darker color and less dense than the first, and yielded 704 grains of finished oil, s. g. 1.12 at 70°.

Thus $4\frac{1}{2}$ gallons = 27 lbs., 4 oz. av. of alcohol of a s. g. .830, and $6\frac{3}{4}$ gallons = $101\frac{1}{4}$ lbs. av. of sulphuric acid of a s. g. 1.845 yielded 3 f.℥ scant, = 1545 grains of finished oil = .81 per cent. of the weight, or .52 per cent. of the volume of the alcohol employed.

A specimen of this oil preserved appears to have undergone little change except in color. From being nearly colorless it is now of a dark brown color. When stirred with water it separates at once without perceptible diminution of volume. The water, however, is rendered cloudy by solution of chloride of barium.

Not satisfied with the yield of this operation, other proportions and manipulations were resorted to, and in the next following operation (of 1854) $2\frac{1}{2}$ gallons = 17 lbs. av. of alcohol s. g. .835 with 30 pints = $56\frac{1}{4}$ lbs. av. of sulphuric acid s. g. 1.848, dis-

tilled in two charges, after prolonged contact, yielded 3 f.℥ of crude oil, or 9 f.℥ finished oil. This was not regarded at the time, however, as a fair experiment with the proportions used, as the two charges yielded very unequally, though the cause of the inequality was not then detected.

At these rates of yield,—and the manipulation was not very faulty,—Hoffman's anodyne cost about one dollar per pound.

In the next operation (1855) the proportions of Serrulas as given by Brande were adopted; namely, "1 part alcohol to 2.5 parts concentrated sulphuric acid." In this, 7 pints=5 lbs. 14 oz. av. of alcohol s. g. .835 and 8 pints=15 lbs. av. of sulphuric acid s. g. 1.845, distilled after prolonged contact, yielded 1 f.℥ of finished oil s. g. 1.16, or .9 per cent. of the volume of the alcohol used. The density of this oil is greater than that of any known authority. It was purified, after 12 hours exposure, by frequent washing with distilled water at first rendered very slightly alkaline, and then by drying in a partial vacuum. A specimen preserved, has undergone the same change of color with the first, but appears otherwise unchanged.

At the next following operation (1855) a set of comparative experiments was determined upon, and ten charges were worked off in the same retort, and under similar circumstances as far as practicable.

The first five charges were nearly in the proportion used by Serrulas.

1st charge. Alcohol, s. g. .832 at 62° 124 f.℥=6 lb. 8 oz. av.

Acid, " 1.842 " 65° 135 f.℥=16 " 4 " "
distilled after prolonged contact, yielded 2½ f.℥ of crude oil, or 7 f.℥ of finished oil s. g. 1.1466 at 72°.

2d charge. Alcohol, s. g. .835 at 58° 125 f.℥=6 lb. 9 oz. av.

Acid, " 1.842 " 65° 136 f.℥=16 " 6 " "
distilled without prolonged contact, yielded 5½ f.℥ of crude oil, or 6 f.℥=395 grains of finished oil, s. g. 1.129 at 72°.

3d charge. Alcohol, s. g. .835 at 58° 126 f.℥=6 lb. 12 oz. av.

Acid, " 1.846 " 60° 142½ f.℥=16 " 14 " "
distilled after prolonged contact, yielded 9 f.℥ of crude oil, or 4 f.℥=252 grains finished oil s. g. 1.066 at 72°.

4th charge. Proportions and materials same as third, distilled after prolonged contact yielded 14 f.℥ of oily upper stratum, or 10 f.℥=651 grains of finished oil s. g. 1.0866 at 72°.

5th charge. Proportions and materials same as the third, distilled after 6 hours (instead of 12 to 24 hours) of contact yielded 17 f.℥ of oily stratum, or 10 f.℥=646 grains of finished oil, s. g. 1.0645 at 72°.

In this operation 634 f.℥ of alcohol and 83¼ lb. of acid yielded 37 f.℥ of finished oil, or .73 per cent. of the measure of the alcohol used. The preserved specimens of these products have all undergone similar change of color to those before mentioned, except that the last three of the five are of a different deeper color, very much like that of aromatic sulphuric acid. Blue litmus paper is not affected by any of these specimens until the moistened paper has been exposed for a few moments, when it becomes red. In this reaction these last do not differ from the earlier specimens, although in these no alkaline solution, but distilled water only, was used in the washing.

In the following series of three charges the proportions of the U. S. Pharmacopœia were pretty closely observed, the quantity of alcohol being the same as in the last series.

1st charge. Alcohol, s. g. .832 at 60° 125 f.℥=6 lb. 8 oz. av.

Acid, " 1.842 " 65° 188 f.℥=23 " 0 " "

distilled after prolonged contact, yielded 9 f.℥ of crude oily stratum (below), or 5½ f.℥ of finished oil s. g. 1.1463 at 72°.

2d charge. Alcohol, s. g. .835 at 58° 125 f.℥=6 lb. 8 oz. av.

Acid, " 1.842 " 65° 174 f.℥=20 " " "

distilled without prolonged contact yielded 8 f.℥ of crude oily stratum (above), or 1 f.℥=505 grains of finished oil s. g. 1.0703 at 72°.

3d charge. Alcohol, s. g. .835 at 58° 126 f.℥=6 lb. 12 oz. av.

Acid, " 1.846 " 60° 189 f.℥=22 " 8¾ " "

distilled after prolonged contact, yielded 4½ f.℥ crude oily stratum (above), or 3¾ f.℥=242 grains of finished oil, s. g. 1.0592 at 72°.

In this series 379 f.℥ of alcohol and 66 lb. of acid yielded 17¼ f.℥ of finished oil, or .57 per cent. of the measure of the alcohol used. Specimens from the product of these charges have all become decomposed, and separated into two strata, light colored below, and dark reddish brown above. The sensible properties and reaction with litmus paper of the dark portion, are the same as in the other specimens. The lower stratum is more oily, strong-

ly acid, and when dropped into water is much diminished in bulk; and the water used reacts strongly with solution of chloride of barium. The proportion of this lower stratum to the upper is in ratio of the original s. g. of the specimen.

In the two charges next following the proportions of the London Pharmacopœia as given by Pereira, are closely followed, the quantity of alcohol still remaining the same as before.

1st charge. Alcohol, s. g. .835 at 58° $126 \text{ f.}\bar{3} = 6 \text{ lb. } 12 \text{ oz. av.}$

Acid, " 1.846 " 60° $116 \text{ f.}\bar{3} = 13 \text{ " } 8 \text{ " "}$
distilled after prolonged digestion, yielded $18\frac{1}{2} \text{ f.}\bar{3}$ of oily stratum (above), or $4 \text{ f.}\bar{3} = 270$ grains of finished oil s. g. 1.0667 at 72° .

2d charge. Proportions and materials the same as the first, distilled without digestion yielded $22 \text{ f.}\bar{3}$ of oily stratum (above), or $6\frac{1}{2} \text{ f.}\bar{3} = 408$ grains of finished oil s. g. 1.0933 at 72° .

In these the alcohol yielded .52 per cent. of its volume. Specimens of these oils are decomposed like those of the last series.

These experiments, though very unsatisfactory in their results, were considered to have established the proportions given by Serrulas as the best,—the utility of a prolonged contact of the materials,—and the sufficiency of washing with distilled water only, in the purification.

Therefore, in the operation of 1856, four charges were worked off, with an aggregate of materials, as follows:

Alcohol, s. g. .821 at 60° 4 gallons = $27\frac{1}{4} \text{ lb. av.}$

Acid, " 1.834 " 60° $4\frac{1}{2} \text{ " } = 68\frac{1}{4} \text{ " "}$

The yield from these was $44 \text{ f.}\bar{3}$ of crude oily stratum (above), or $4\frac{1}{2} \text{ f.}\bar{3} = 2280$ grains of finished oil, s. g. 1.097 at 60° , or 1.2 per cent. by weight, or .88 per cent. by volume, of the alcohol used.

In a subsequent operation, and the last, the yield was 1.32 per cent. by weight, or 1 per cent. by volume, of the alcohol, with the above proportions; and these results are now regarded as the expression of all the skill and knowledge of the writer on the subject, after having watched it with accumulating experience and close observation, stimulated by disappointment; for this best yield is but little over one-third of that stated to have been obtained at Apothecaries Hall, London; and by Mr. E. N. Kent, (Amer. Jour. Pharm., 1852, p. 257,) on the very small scale.

Early in the management of this preparation it was observed

that washing with solution of potassa of the prescribed strength decomposed some of the oil, or rendered it soluble to a certain extent.

It was next noticed that the fuller the retort the larger the yield; and this is probably due to the fact that the oil must be mechanically carried over with the vapors from being produced and distilled at a temperature much below its boiling point. A shallow leaden still would doubtless give a larger product.

The accurate management and regulation of the fire and temperature by an immersed thermometer, was the next step attained; and finally, it was observed that when the sulphate of lead precipitated from the acid on dilution, was suffered to separate completely, and was carefully excluded from the retort, the yield was at least one-third greater. Indeed, such an influence has this small precipitate upon the viscosity of the boiling mixture toward the close of the process, that when excluded, and the temperature carefully managed no frothing up occurs, and the boiling can be continued until only uncondensable gases pass over. This is the most important fact yet arrived at in connection with this process.

The formula now used is as follows:

Take of Alcohol, (s. g. .835,) 1 gal.= 6 lb. 12 oz. av.	
Sulphuric acid, (s. g. 1.845) 1 gal. 14½ f. 3 = 16 lb. 14 oz. av.	
Carbonate of soda, 10 grs.	
Distilled water, a sufficient quantity.	

To the alcohol, in a suitable vessel, add the sulphuric acid slowly. Stir the mixture and allow it to stand twenty-four hours. Decant the clear liquid into a three gallon retort, excluding all the sediment, and distil it from a sand bath at a temperature between 318° and 330°, till a black froth arises in the retort, or until the distillation of liquid ceases, and only gaseous products pass through the condenser. Separate the oily stratum from the distillate, and expose it for twelve hours in a shallow capsule. Wash it first with an equal volume of distilled water, then with a solution of the carbonate of soda in a similar proportion of distilled water, and finally with distilled water again. The finished product should measure at least ten fluid drachms, s. g. 1.1.

On mixing the alcohol and acid the mixture becomes heated

to 225° , and while hot measures 6 f.℥ more than the sum of the ingredients. When cold, however, it measures 15 f.℥ less than when hot, or 9 f.℥ less than the sum of the ingredients. After standing twenty-four hours the mixture should be clear, and of a very pale brown color with a pink tinge, or, if the alcohol is very good, should be as nearly colorless as though the acid had been diluted with so much water. On the other hand, if the alcohol contains much grain oil, the mixture will be of a pink color inclining to purple. The decantation should be very carefully performed, so that all the precipitated sulphate of lead may be excluded, and the retort should be of such a size as to be three-fourths filled. The retort should be fitted with a thermometer (bulb immersed in the mixture) in the tubulure, and should be so placed on the sand bath that all parts of the neck incline toward the condenser. It should be placed in a sand pot, with only about a pint of sand under the bottom to distribute the weight,—for if much sand be used it is difficult to manage the temperature nicely. A large Liebig's condenser should be adapted to the retort beak, and the mixture then heated up as quickly as possible to 300° , when the fire door is opened, and the fire farther damped with a layer of fresh coal. The temperature, however, goes on rising from the heat of the pot and sand till it reaches about 324° , where, by management of the fire door it may be steadily maintained till the charge is finished. The mixture becomes brown as it is heated and boils at 250° with the distillation of an ethereal liquid. In proportion as sulphurous acid gas comes over with the distillate, the mixture becomes of a darker color, and the distillate more yellow, but heavy oil of wine is produced and comes over with the ether before the smell of the gas is noticed. If the temperature rises much above 330° frothing up is very liable to occur at almost any stage of the process, but if maintained, as it can easily be, at 322° to 326° half the charges, at least, may be finished without any frothing at all. This termination is very much to be preferred, for the lifting of a heavy frothing retort with such contents, at such a temperature is attended with much danger. Each charge requires about four hours for its successful management; and two charges can be worked off the same retort in a day. The discharging of so hot a liquid is attended with great risk of breaking the tubulure, so that it

is better to use two retorts, when three charges can be conveniently worked off from one fire in a day.

When a small quantity of water is poured into a frothing retort it causes the distillation of a colorless watery liquid of a most agreeable aromatic odor and taste, quite different from that of oil of wine.

With these proportions the oily stratum of the distillate is almost always on top, because the water that comes over is highly charged with sulphurous acid. With the proportions of the Pharmacopœia, however, it is as often below as above.

When two or more charges are worked off at one making it is economical to collect the oily strata of the distillate in a small retort, and to recover the ether from the whole at a temperature below 140° . The oily residue is then thrown into thrice its bulk of water and well stirred. The oil separates at once in colorless (or nearly so) opalescent globules, and falls to the bottom of the vessel nearly free from impurities. The precautionary washing with dilute solution of carbonate of soda, and again with distilled water is, however, advisable and proper. The whole is then thrown into a well moistened filter, from which, when drained, it is drawn into a measure through a small hole made in the bottom of the filter.

These washings are wasteful, and occasion the greater part of the loss in working on the small scale, the water being always left opaque from small particles of oil in suspension. In washing 5 f.℥ of oil, about 8 minims nearly is lost each time, or an aggregate of nearly half a drachm. From the difficulty with which this suspended portion separates from the washings upon long standing, and from the fact that the washings increase the s. g. of the product very much, it is probable that the portion thus lost is mainly light oil of wine or etherole.

When oil of wine is made in quantity, and to be kept, it should be diluted with twice its bulk of alcohol, to protect it from decomposition or change of color, for without this it becomes dark colored, and more impure than before being washed; but how long beyond nine months it will remain unchanged when thus diluted is not yet determined. Upon the scale of this formula the cost of materials, apparatus and fuel, without estimating labor, will not produce heavy oil of wine at less than \$1.60 to

\$1.70 per fluid ounce, instead of 70 or 80 cents, as it should be by the authorities above mentioned.

The great disproportion between the materials and product, under the most favorable circumstances make it most desirable that some economical process should be found for this preparation, and the writer has been long under the impression that by the distillation of anhydrous sulphovinates better results might be had. The few crude trials made in this direction have, however, thus far given no hope of success as far as practical application is concerned.

The attempts to make heavy oil of wine from the residue of a well conducted process for ether, have also, in the writer's hands, always proved abortive, or, at least have yielded too small a product to pay for the fuel and apparatus involved. When the materials for ether are worked to the best advantage the residue yields much light oil of wine, but very little heavy oil of wine, and no method has yet been discovered by which such residue can be utilized in the preparation of heavy oil of wine. When ether is made on the small scale, and over a lamp or fire, the materials are rarely managed to the best advantage. The residue, then, will yield a notable proportion of heavy oil of wine, if the distillation be continued at a higher temperature.

Thus all the efforts made at this Laboratory to produce heavy oil of wine cheaply, have thus far failed signally. But the preparation produced has been of a uniform character and of full medicinal effect and value, and there is no good reason why so valuable a curative agent should not be restored to the medical profession generally. There can be but little doubt that the original character of the compound spirit of ether was based upon an intrinsic curative value, and that such value belonged mainly to the ethereal oil as the anodyne ingredient; and there certainly can be as little doubt now, that for some years past the preparation sold under the name of Hoffman's anodyne has been forcibly dragged along by the materia medica list, supported alone by its unused formula and former character, and that in a few years more it must be dropped entirely or transferred to the class of diffusible stimuli. It remains, therefore, as a question for decision in the medical profession, whether such valuable agents can be sacrificed with impunity to the cupidity of manu-

facturers, taking with them, as they must do, public confidence and support from the profession, and transferring this confidence and support to some enterprising quack, who, as in the case of the compound cathartic pill, preparations of *spigelia*, *quinia*, *strychnia*, &c., through cupidity again, takes it up under a new name, makes it properly and uses it to the irreparable injury of legitimate medicine.

The assertion is probably not strictly true that the curative agency of Hoffman's anodyne belongs to it as found in the market, and not as contemplated in the Pharmacopœia, but rather that its inefficiency is thus fastened upon it, so that every physician who prescribes it loses by it in his value to the community, and transmits the effect to his profession at large. Any proposition, therefore, to dilute the Pharmacopœia down to the manufacturers' standard in this, or any preparation, should be entertained with great caution by all who have faith or experience in an intrinsic value to medicinal preparations. The writer, from being firmly established in the principles truth and efficacy of the theory and practice of the science and art of medicine, and from having had an opportunity of using good medicinal preparations, allows no chance of opposing such propositions to escape him.

In Soubeiran's process for making ether, (see Amer. Jour. Pharm., vol. iv., 3d series, p. 385,) the mixture of ether and alcohol delivered by the middle condenser may be properly used in making the compound spirit of ether. It is usually not far from the proper composition, but requires only the addition of a little alcohol to bring it to the proper s. g. When ether has been made strictly according to the U. S. Pharmacopœia, and is mixed with alcohol in the proportion directed for the compound spirit, the s. g. of the mixture is found to vary between .808 and .814. The rectified residue of the ether process brought up to the s. g. of .812 by the addition of alcohol, is therefore properly available for making the compound spirit of ether from, yet at that stage it is as far from being Hoffman's anodyne as diluted alcohol is from being laudanum, for it contains scarcely a trace of heavy oil of wine, while its light oil of wine has not been considered of anodyne effect.

But if, as in this Laboratory, the whole of the ether residue is utilized in the extraction of tannic acid, the direct mixture of

the ingredients must be resorted to. Whichever course is adopted, however, no collateral product is lost, and the preparations are practically identical.

The officinal compound spirit of ether consists of

Ethereal oil,	3 f.℥,	. . .	or	1.56	per cent.
Ether,	8 f.℥,	. . .	"	32.81	"
Alcohol,	16 f.℥,	. . .	"	65.62	"

The mixing of these ingredients causes a diminution of volume about equal to the measure of the oil, so that the finished preparation has the volumetric composition given, and each fluid drachm contains nearly one minum of the heavy oil of wine.

The weight of 24 f.℥ of it, at 60° is about 8640 grains, hence 1 f.℥ weighs 360 grains. The weight of 3 f.℥ of ethereal oil is 188 grains, hence the proportion of the latter ingredient by weight amounts to 2.17 per cent.

Compound spirit of ether thus made is a colorless bright mobile liquid, of a fruity ethereal odor, of s. g. .812 to .816, and neutral or very slightly acid to litmus paper. It usually gives a very faint cloudiness with solution of chloride of barium after some months keeping.

Five drops=2m of the compound spirit, well stirred into one pint of water give a distinct oily surface on standing for a moment, and yields the characteristic fruity odor of the oil free from that of the ether and alcohol.

Sixteen drops=6m, stirred in a like manner into one pint of water visibly affects the transparency of the water.

Sixty drops=23m renders the water decidedly milky, but not properly opalescent, for the milkiness is of a dull leaden color, and not bluish or pearly as in the appearance generally called opalescent.

Two fluid drachms renders the pint of water so turbid that the bottom of the pint beaker in which the mixture is made can be but just distinctly seen on looking down through the long axis. With four fluid drachms the bottom cannot be seen. The odor and appearance of this mixture are very characteristic. A few minutes after the stirring has ceased the minute globules of oil begin to collect at the bottom of the beaker in the form of a fine, very scanty white precipitate, while the surface is but little more greasy in appearance than when one or two fluid drachms had been stirred in.

If the proportion of the ethereal oil shall have been reduced, and its deficiency supplied by a fixed oil, for purposes of deception, the surface of the mixture will indicate it by the film which collects there in much greater proportion. In this case the simple convenient test, proposed by Prof. Procter, of drawing a slip of paper across the surface, and then drying it with a gentle heat, will expose the fraud if the proportion of water in the mixture is not above one-half. When deception is attempted by means of fixed oils, the milkiness is commonly too great, and of an opaque character not at all like the transparent leaden milkiness attempted to be described above.

One fluid ounce of the compound spirit of ether evaporated to dryness in a water bath, with an excess (say 60 drops of an ordinary test solution) of solution of chloride of barium, yields an insoluble precipitate, which after being washed on a tared filter with two fluid ounces of hot water, and dried at 212° , weighs 6.25 grains. This test very conveniently estimates the proportion of heavy oil of wine, for it takes no cognisance of light oil of wine, or any mere hydrocarbon, because its reaction depends upon the conversion into sulphate of baryta, of the characteristic constituent of the heavy oil, namely the elements of sulphuric acid. Moreover, it is a test not easy to circumvent, for it is difficult to combine sulphuric, or even sulphovinic acid practically in this mixture, so as not to be detected by solution of chloride of barium.

These few simple and easy tests are quite sufficient to enable any one to distinguish the officinal preparation, and no one need hesitate in condemning any specimen which will not fulfil their indications.

Specimens purchased from four of the best drug houses in New York city, and representing the three largest, and indeed almost the only manufacturers in the United States, all failed on the very threshold of this testing. These specimens, however, might all have been condemned without the application of a single test except the sense of smell, for a more villainous odor of bad empyreumatic ether, mixed with bad oily alcohol, aggravated in two cases by putrescent bladders used under the corks, could hardly be imagined. One specimen (of conservative prac-

tice) consisted only of bad ether and good alcohol, and was doubtless made where it was sold, for the house that sold it "did not know where it was made."

U. S. Naval Laboratory, New York, March, 1857.

ON VERATRUM VIRIDE.

By JOSEPH G. RICHARDSON, of Philadelphia.

(*An Inaugural Essay presented to the Philadelphia College of Pharmacy.*)

The subject of the *Veratrum viride*, or American hellebore, appears to have attracted considerable attention in the pharmaceutical world about twenty years since, when the *Journal of Pharmacy* contained several articles giving the results of experiments on this plant. In the October number for the year 1835 (Vol. I. second series), is an able paper by Dr. Charles Osgood, of Providence, R. I., who seems to have been one of the first to call particular attention to the drug; by preparing a decoction of the root, precipitating by ammonia, boiling this precipitate with animal charcoal, and evaporating the solution, he obtained a white, inodorous and very acrid powder, which he considered to be the active principle of the plant. He states, however, that in drying this substance at about the temperature of 120° F. the greater part of it was volatilized and lost, thereby preventing his intended examination of its properties, and he was subsequently prevented by professional engagements from repeating his experiment. Fortunately, however, these duties did not interfere with his making extended observations on the therapeutical virtues, which he found to be of considerable importance, although differing in some respects from those of the white hellebore; and from this dissimilarity in its effects upon the human system, as well as from the volatility of the principle which he obtained in his first experiment, he concluded that the plant did *not* contain veratria.

In the ninth volume of the *Journal* a paper by Thomas A. Mitchell is presented, giving a proximate analysis of this plant, in which he mentions having obtained an active principle in the form of a white powder, but in such small amount as to preclude a chemical examination of its properties.

But the most accurate investigation of the *Veratrum viride* as

yet published is that comprised in an inaugural essay by Henry W. Worthington, contained in the tenth volume of the Journal above mentioned; in addition to the other proximate principles he also obtained a white powder, soluble in acids, and powerfully errhine when brought in contact with the lining membrane of the nose, corresponding in these respects with the alkaloid veratria; but the quantity prepared appears to have been, as in the other instances, too small to admit of the application of a series of chemical tests.

These experiments, conflicting as they do in their results with those of Dr. Osgood, appear to require at least a careful repetition in order to be conclusive, and the increasing knowledge of the valuable medical properties of this plant in the treatment of neuralgia and rheumatism, seem to demand a more complete and thorough analysis; that the reply to the question, Does *Veratrum viride* contain veratria? may be no longer a conjectural one. To furnish a decisive answer to this inquiry is the chief object of the present article; and this end is, I think, to be obtained only by a careful application of those chemical tests which distinguish the alkaloid veratria, as many instances occur where bodies precisely similar as far as the senses are competent to decide, differ totally in their chemical reactions.

With this necessarily somewhat prolonged introduction I will now proceed with a detail of the experiments upon the alkaloid, premising that as the other proximate principles are of comparatively little importance, (as determined by former operators,) I shall confine my attention wholly to the supposed veratria. In the first place a series of experiments was undertaken to discover the best method for obtaining the active principle, as follows:

Experiment 1st.—A portion of the root properly bruised, was macerated with sufficient water to cover it, for three days, the mass was then transferred to a percolator, and water poured on until the fluid passed nearly tasteless and about six pints of liquid had been obtained. This solution was treated with liquor plumbi subacetatis until no further precipitate was produced, and into the clear liquid separated from the precipitate a stream of sulphuretted hydrogen was passed until sulphuret of lead ceased to be formed, and the liquid had the characteristic odor of the gas;

after boiling to expel the superfluous hydrosulphuric acid, it was evaporated to one-half, magnesia added in excess, and the whole boiled up several times. The liquid was then filtered off, the precipitate boiled with absolute alcohol, and the solution evaporated to dryness, leaving a dark brown resinous looking matter; this was then redissolved in dilute sulphuric acid, and when precipitated by the addition of ammonia was in very minute quantity, and of a reddish color. It had a bitter acrid taste, was colored red by sulphuric acid and yellow by nitric acid.

Experiment 2d.—Eight ounces of the bruised root were macerated for two days in a dilute solution of acetic acid; the mass placed in a percolator and water poured on until it no longer became acid; the solution was evaporated to about four fluidounces, precipitated by ammonia in excess, and the liquid filtered off; the precipitate, which was of a dark brown color, weighed after drying ten and a half grains.

Experiment 3d.—The aqueous solution of the extract from eight ounces of the root was evaporated to about twenty-four fluidounces, filtered, and precipitated by ammonia in excess; the liquid still containing the precipitate suspended in it was shaken with about four ounces of chloroform; after allowing this mixture to stand a sufficient length of time for the two fluids to separate, the superior layer was decanted, and the chloroformic solution washed until colorless; it was then evaporated to dryness in a water bath, the residue dissolved in dilute sulphuric acid, precipitated by ammonia and re-dissolved by chloroform. By evaporation, this fluid gave about two grains of a whitish powder, which was colored red by sulphuric acid, and acted powerfully as a sternutatory.

Experiment 4th.—The solution obtained as before from eight ounces of the root was filtered and precipitated by ammonia; about eight fluidounces of benzole were then added, and the liquids thoroughly mixed by agitation; they were then allowed to remain at rest until two separate layers were formed, when the inferior one was removed by a syphon. The solution in benzole was repeatedly washed until it became colorless, and upon evaporation in a water bath gave a mass which dissolved readily in sulphuric acid, and was precipitated by an alkali of a pure white color.

Experiment 5th.—A small quantity of the aqueous solution obtained from the root was treated with bichromate of potassa, which produced a reddish brown precipitate; after the subsidence of this, the supernatant liquid was poured off, and about an ounce of water added for the purpose of washing the residue; it was, however, nearly or quite dissolved in that amount of menstruum.

The first of these experiments being merely a corroboration of Mr. Worthington's process, will require no comment. Thinking that if, as Dr. Osgood supposed, the active principle was a volatile one, a part might be driven off by the heat used in evaporation, the acetic acid employed in the second experiment was added to prevent, by forming a salt with any uncombined alkaloid, such a loss, as well as to assist the extraction from the plant. Third and fourth experiments are based respectively upon the power which chloroform and benzole both have of dissolving the alkaloids; while the fifth was an attempt to apply the principle of a recently published English process for preparing strychnia to the extraction of this substance.

The process by the aid of benzole having given the most satisfactory result, a quantity of the contused root was macerated for sixty hours in dilute sulphuric acid; the dregs were then expressed strongly, stirred up with another portion of water and again expressed; the liquids were filtered without concentration, and precipitated by ammonia, the precipitate filtered off, washed and dissolved in dilute sulphuric acid, and again precipitated by ammonia; the liquid without filtration was then agitated with twenty-four fluidounces of benzole, the two layers allowed to separate, by standing and the benzolic solution washed until colorless; this solution itself divided into two portions, the one clear and limpid, and the other white and opaque, very much resembling thick cream; these were then separately evaporated by the heat of a water bath, when the creamy liquid was found in reality to contain nearly all the valuable matter, the clear portion leaving scarcely any residue. The substance produced by the evaporation of these solutions was of a white color with a slight tinge of red, and dissolved readily in sulphuric acid, with the exception of a small amount of resin; this solution, after being filtered, was precipitated by ammonia, the precipitate washed, and when carefully dried was found to weigh fourteen grains.

The physical properties of this precipitate were as follows: It was white, uncrystallizable and inodorous, but a small portion coming in contact with the lining membrane of the nostril, produced at first a numbness succeeded by the most violent sneezing, which continued for about ten minutes, and left a tingling sensation which lasted for a considerable time. When heated it became discolored, swelled up and was consumed below a red heat; it was nearly insoluble in water, quite soluble in alcohol and partially so in ether. It dissolved readily in sulphuric, nitric and chlorohydric acids, and formed colorless solutions. Through the kindness of a medical friend, I am enabled to state that this substance, administered in a dose of one-tenth of a grain three times a day, afforded very marked relief in a case of facial neuralgia, without producing any unpleasant symptoms.

We now come to the consideration of its chemical properties, and here the field is almost unoccupied: for some unknown reason the reactions of the alkaloid veratria appear to have been but little studied, and while for many of the vegetable principles there are several distinctive tests, for this we have but one, (the red color produced by sulphuric acid,) which is characteristic. Under these circumstances it became necessary, first, to draw a line before describing a parallel, or in other words to examine veratria itself in order to prove that this was identical. The tests applied (with the exception of the two last), were those usually employed in the detection of the other alkaloids, and were as follows:—

<i>On Veratria.</i>	<i>On the alkaloid of Veratrum viride.</i>
Tannin in a dilute solution, a white precipitate.	Tannin in a dilute solution, a white precipitate.
Ammonia in a dilute solution, a white precipitate.	Ammonia in a dilute solution, a white precipitate.
Sulphuric acid, a ruby or crimson* red color.	Sulphuric acid, a ruby red color.
Nitric acid, a clear yellow color.	Nitric acid, a clear yellow color.
Chlorine water on a muriate, no precipitate or coloration.	Chlorine water on a muriate, no precipitate or coloration.

* This color was of rather a brighter shade than that produced in the other, which difference was probably owing to a minute amount of coloring matter retained by the latter.

Solution of bichloride of mercury, on a muriate, a white precipitate.

Tincture of chloride of iron on a muriate, no precipitate or coloration.

Iodo-hydrargyrate of potassium, a white precipitate.

Dissolved in weak chlorine water, and ammonia added, a white precipitate; a small portion of ferrocyanide of potassium introduced before the ammonia, made no alteration.

Mixed with a large amount of sulphuric acid and a particle of nitrate of potassa added, no additional coloration.

Solution of chloride of gold, a yellow precipitate insoluble in an excess: this precipitate was, however, soluble when boiled, forming a greenish liquid in which caustic potassa gave a purplish black precipitate.

Tincture of iodine, a brownish red precipitate soluble by boiling into a clear red liquid; ammonia added to this while still warm gave a yellow precipitate, gradually changing to white.*

Solution of bichloride of mercury on a muriate, a white precipitate.

Tincture of chloride of iron on a muriate, no precipitate or coloration.

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Tincture of iodine, a brownish red precipitate dissolved on boiling into a clear red liquid; ammonia added to this while still warm, gave a yellow precipitate, gradually changing to white.

These experiments which were carefully made, and where any doubt appeared to exist, several times repeated, show that, not only in its physical characteristics, but also in its chemical reactions, the alkaloid of *veratrum viride* is identical with the *veratria* of the *veratrum sabadilla*; thus answering, and I confidently believe conclusively, the mooted question, whose solution was my original object.

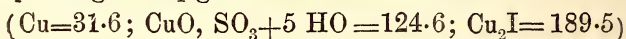
* The precipitates produced in the solutions with chloride of gold and tincture of iodine appear to be characteristic; they are at least sufficient to distinguish this alkaloid from *strychnia*, *quinia* and *cinchonia*.

ON THE SOLUBILITY OF IODIDES IN SYRUPUS FERRI IODIDI.

BY JNO. M. MAISCH.

Recently a syrup of iodide of iron came into my hands which had been obtained of a manufacturing chemist. As it had undergone decomposition and contained free iodine, I was desirous of neutralizing the same so as to have it fit for use. Having put some fragments of iron into it, the syrup was set aside for several weeks, when, on examining it, I was surprised to find the iron covered with copper. From what source was that metal present, and why was it not precipitated by the iodine as iodide of copper, which is considered insoluble? These questions presented themselves, and, in order to solve them, a series of experiments were undertaken with the following result:—

The syrup, which in the above way had been deprived of copper, still contained free iodine. One fluid ounce was mixed with a solution of sulphate of copper, two grains of which had been dissolved in 100 grs. of water; every drop of this solution produced a thick precipitate, which, however, dissolved on being agitated with the syrup, which remained perfectly clear after 16 grains of the solution had been added; the 17th grain produced a slight cloudiness, which was little increased on addition of the 18th grain, the syrup still remaining transparent; but 20 grains caused such a precipitate that the syrup looked very turbid, and had lost all transparency. Thus it will be seen that one fluidounce was capable of decomposing $\frac{1}{3}$ gr. of sulphate of copper, and holding the formed iodide of copper in solution. $\frac{1}{3}$ grain of sulphate contains 1-12th gr. of metallic copper corresponding with $\frac{1}{4}$ gr. of its iodide.



Thirty grains of iron and three grains of copper, both in the state of fine filings, were agitated with eight grains of iodine and the necessary quantity of water. A greyish matter floated in the liquid corresponding in all physical properties with a precipitate of iodide of copper. The liquid was filtered into a vial containing enough sugar to make one ounce of syrup, which was of a greenish unsuspecting appearance, and did not separate any copper on a bright spatula having been left in contact with it

for an hour ; the iron wire which had been thrown in, however, was covered with copper after standing twelve hours, and a considerable precipitate of iodide of copper had been thrown down.

Freshly precipitated iodide of copper was put on a filter, and syrup of iodide of iron filtered through it. The filtered liquor on standing till next day had precipitated iodide of copper, and the remaining solution still contained copper which could be thrown down by iron.

A syrup which does not contain free iodine may be agitated with copper turnings without dissolving any of it ; but when containing iodine in a free state, it dissolved some copper, which covered the iron that had been afterwards thrown in.

A much larger proportion of iodide of copper could be dissolved in the syrup if it was kept at 212° F. One fluidounce of the syrup was put in a water bath heated to 212° ; a quantity of a solution containing 2 grs. of sulphate of copper had to be added before a cloudiness was obtained. These two grains correspond with $1\frac{1}{2}$ grs. of iodide of copper, which, for the greater part was thrown down on cooling.

Most experiments were performed with the neutral syrup, and with another sample that had decomposed on exposure to the air, and contained some free iodine. The results of the solubility of iodide of copper varied slightly in both cases, and the neutral syrup seems to take up rather more of that insoluble compound ; the difference though is very slight.

It was curiosity now which induced me to see whether others of the insoluble iodides were taken up by the iron preparation ; and I was surprised to find the iodides of lead, silver and mercury easily soluble. The green iodide of mercury turned black and dark green as soon as thrown in the syrup ; the red iodide was taken up in very considerable quantities, and after standing several days, the syrup had a voluminous sediment of a dirty blackish yellow iodide, while the supernatant liquid had scarcely a brownish tinge. Here the question arises : how does a reduction take place, and what is the result of it ? May not the formation of a soluble double iodide of iron and mercury cause the ready solubility of the red iodide of the metal, which, through the influence of the atmosphere, is decomposed again ?

These experiments show us at any rate,

1. That iodide of iron dissolves more or less readily the insoluble iodides of some heavy metals, especially of *copper, lead, silver* and *mercury*.

2. That the presence of copper during the process of preparing the syrup causes the same to be contaminated with that poisonous metal, although iron may have been in large excess.

3. That iron decomposes all iodide of copper thus dissolved, only after a prolonged contact.

The practical results will be,—

1. To guard against the presence of any metal but iron during the preparation of this officinal syrup.

2. To be able to combine the action of mercury and iron with iodine in a dissolved state. On this, however, some more experiments are needed.

Philadelphia, March, 1857.

REMARKS IN REFERENCE TO THE SPURIOUS WINTER'S BARK DESCRIBED IN THE JANUARY NUMBER OF THIS JOURNAL.

BY DANIEL HANBURY.

London, Feb. 14, 1857.

To the Editor of the American Journal of Pharmacy:—

SIR:—Having perused with some interest the communication of E. S. Wayne in your January number, relative to a spurious *Winter's bark*, recently offered for sale in New York and Philadelphia, I am induced to address you a few remarks upon it, because I am convinced that the conclusion that Mr. Wayne has drawn, is not that at which he would have arrived, if he had possessed authentic specimens of the barks to which he refers.

Discovering that the new *Winter's bark* had been imported from the west coast of South America, Mr. Wayne refers to the description of *Malambo bark* as given in the *Pharmaceutical Journal and Transactions** and in other works, and finding a certain coincidence in the recorded physical characters of the

* Mr. Wayne quotes this periodical under the title of the "*London Journal of Pharmacy*."

Malambo with those he had observed in the new *Winter's bark*, he persuades himself that the two are identical.

In the 9th volume of the same Journal, Mr. Wayne finds some account of *Copalchi bark*, a bitter and aromatic bark allied to *Cascarilla*, and produced by a plant of the same genus, occurring in Central and South America. A certain agreement in the chemical characters of *Malambo* and *Copalchi*, in their reputed medicinal properties and in their place of growth, have induced Mr. Wayne to regard them as identical: and *without having seen either*, he concludes his notice in the following terms:

* * * * And, to sum up the whole, the evidence is so conclusive to me, that I have no hesitancy in saying that the *Malambo bark* described by Ure, the *Copalchi* by Stark and Pereira as *Corky Copalchi*, and the bark in question are identical."

The evidence for this conclusion, I cannot but consider as wholly insufficient; but the best method by which I can convince you of its untenable nature, is by submitting to you specimens of the barks themselves.

I have accordingly the pleasure to forward specimens of the following:

1. *Malambo bark*, from New Grenada.
2. *Quilled Copalchi bark*.
3. *Corky Copalchi bark* from San Blas, Mexico; vide Stark, in *Pharm. Journ. and Trans.*, vol. ix. p. 463.

With regard to the botanical origin of these barks, I believe there is no doubt that both sorts of *Copalchi* are derived from some species of *Croton*; but of *Malambo*, the source is yet undetermined.

Winter's bark,—I mean the bark of *Drimys Winteri*, Forst., with which species are now united the allied species *D. Chilensis*, DeC., *D. Granatensis*, Linn. fil., and *D. Mexicana*, DeC.,*—does not occur (so far as I know) in European pharmacy. Its place is supplied by another bark (samples of which I send you), of the origin of which nothing positive has been ascertained. This latter bark is regarded by many writers on materia medica as *true Winter's bark*, an opinion of the fallacy of which any one

* Vide I. D. Hooker's *Botany of the Antarctic Voyage*:—*Flora Antarctica*, part ii, p. 229.; also *Botanical Magazine*, 1854.

may convince himself by consulting authentic specimens of the bark *Drimys Winteri*, such as are to be found in the museums of London and Paris.

I trust you will pardon the freedom with which I have attempted to rectify what I consider to be the incorrect view which your correspondent, Mr. Wayne, has taken, and believe me to be

Respectfully yours,

DAN. HANBURY.

NOTE BY THE EDITOR.—After carefully comparing the specimens received from Mr. Hanbury with the bark described by Mr. Wayne as “so-called Winter’s Bark,” we have arrived at the conclusion—1st. That Mr. Wayne is correct, so far as regards the identity of that bark and the malambo bark of New Grenada; and 2nd. That Mr. Hanbury is correct in believing that the quilled copalchi bark and the corky copalchi bark of Stark are entirely different and distinct from the bark described by Mr. Wayne.

In reference to the first conclusion, so perfectly similar is the specimen sent by Mr. Hanbury with our specimen of the new “winter’s bark,” that any one might infer them to have been once united. They are identical in color, externally and internally, in texture, both to the naked eye and under a lens, in thickness, in taste, in odor when bruised, and in the contour and number of the warty excrescences dotted over the external surface. Further, their chemical characteristics are the same, as the essay following, upon the same subject, by Mr. Dancy, will give evidence.

In regard to the copalchi barks sent by Mr. Hanbury, no one would mistake them for the malambo who had seen them together. The *quilled copalchi* has considerable analogy to the cascarilla in the color of its epidermis and that of its inner surface, but it is thicker, more regular in its quills, and, in fact, has much the aspect of some of the pale cinchona barks, being half a line thick and the quills four to eight lines in diameter and six inches long. It is less bitter and aromatic than the cascarilla, but exhales an analogous musky odor when burnt slowly.

The *corky copalchi* is in pieces varying from two to five inches long, curved inwards but not quilled, from one to two lines thick, and covered with a light ash-colored epidermis, varying in thickness from extreme thinness to a line or more, where its suberose character is exhibited in irregular wart-like excrescences. Some of the smaller of these resemble somewhat those on the malambo bark in appearance, but differ entirely in their soft corky texture, whilst the inside or proper bark has a darker reddish brown color, and when recently cut somewhat plum-colored. Added to these characters the bark possesses a bitterness so intense that it may be compared to quassia, with less aroma than the preceding. It also gives off a somewhat musky odor in burning.

In reference to the bark sent by Mr. Hanbury as "the Winter's bark of English commerce," and which he says is *not* true Winter's bark, though so regarded by many writers on *Materia Medica*, we may remark, that it is identical in structure, color, taste and chemical characteristics with a bark in the cabinet of the Philadelphia College of Pharmacy, which was presented more than twenty years ago to that institution by M. Guibourt, of Paris, as true winter's bark, yet unlike the winter's bark examined by M. Henry, it contains neither tannin nor sesqui-oxide of iron, and for this reason Professor Thomas was led to doubt its genuineness several years since. This bark is evidently that described by Dr. Wood in the U. S. Dispensatory as the product of *Drimys Winteri*, and from the smoothness of the epidermis and a slight shade of green in the exterior is probably derived from the smooth branches of the tree.

Along with the above sample from Mr. Hanbury, was another labelled "Cortex Winteranus Mexicanus (?*Drimys Winteri*, Forst.)" This bark has a rough epidermis with longitudinal fissures, greyish-brown in some parts and dark reddish brown in spots, about two lines thick, and evidently occurs in large rolled pieces, judging from the fragment sent to us. Its internal color when cut transversely is reddish brown, with spots of a light grey color. When a smooth section is examined with a lens, these lighter spots seem to be a resinous deposit, alternating irregularly in the cortical structure, and the whole bark when thus closely examined has a resinous aspect. To the taste it is exceedingly pungent and less aromatic than the bark last noticed. Its pungency is so intense that it may be compared to black pepper. It contains no tannin, but when macerated in distilled water with a few drops of pure hydrochloric acid, the liquid yields Prussian blue on the addition of ferrocyanuret of potassium. It is to be hoped that Mr. Hanbury, who has access to authentic specimens of the true bark of *Drimys Winteri*, will test them for tannin and sesqui-oxide of iron, and give a description of them as compared with the published accounts.

AN ESSAY ON MALAMBO OR MATIAS BARK.

BY FRANK B. DANCY.

(An Inaugural Essay presented to the Philadelphia College of Pharmacy.)

My attention was first called to this bark by Professor Thomas, a specimen having been presented to him by an importer of drugs of this city, who declared that it was the genuine Winter's bark, and was selling it as such. Professor Thomas, after a slight examination, decided that it was not the Winter's bark, from the circumstance that he was unable to detect in it the presence of either tannin or oxide of iron, two substances stated to be present,

according to the authority of M. Henry. He then suggested it to me as a subject of sufficient interest for examination in order to determine, if possible, the true name and nature of the so-called Winter's bark. In hope of being able to establish this fact, the following investigations were undertaken. The only information I could get from the importer in reference to the bark was, that it was shipped from the port of Maracaybo, and was invoiced Pale Matias; but how he came to regard it as the true Winter's bark, he could not give sufficient explanation, other than that in appearance and aromatic properties it resembled it. How far a party is justifiable in making representations upon such slight evidence is not difficult to determine.

Description.

The bark as it presents itself is in pieces of from one to three inches wide, from three to four lines in thickness, and from a few inches to two feet in length, and has a slight inward curve. The inside of the bark is mostly of a dark brown color, while the external side is of a pale yellowish tinge, with a surface somewhat smooth, but where it is studded with a curious tuberculous excrescence. It breaks with a splintery fracture, exhibiting a dull rusty brown color. To the taste it is exceedingly bitter and aromatic. It breaks easily under the pestle, and the powder has a snuffy color and a moist and oily appearance, owing to the large amount of oil the bark contains. The odor of the freshly powdered bark is powerfully aromatic and diffusive.

ANALYSIS.

Experiment 1st.—1,000 grains of the finely bruised bark were put into a retort of sufficient capacity, with one pint of water, and allowed to macerate twenty-four hours, after which, heat was applied, and the distillation commenced. The water soon passed over charged with the oil; when the water had nearly all passed over and ceased to have a milky appearance, the process was stopped, and the distillate was set aside for twenty-four hours, so as to allow the complete separation of the oil. With a small glass syringe the oil was then carefully removed from the water. The product was half a fluid drachm of oil of a light yellowish color, possessing the strong aromatic odor of the bark, and completely soluble in alcohol and ether.

Experiment 2nd.—To the remaining material in the retort was added half a pint of water, and strongly pressed and filtered. This decoction had an intensely bitter taste, but was almost deprived of the aromatic odor of the bark. To a small portion of the decoction was added a few drops of the muriated tincture of iron, which caused a slight deepening of color, but produced no precipitate even after twenty-four hours standing. To another portion of the decoction was added a warm solution of gelatine, but no change was produced. These two experiments plainly show the absence of tannin. To another portion of the decoction was added a few drops of strong solution of acetate of lead, when a heavy precipitate was thrown down, indicating the presence of gum. A few drops of tincture of iodine were dropped into about an ounce of the decoction, which occasioned a blackish blue color throughout the liquid, and disappeared on being heated. By this was recognized the presence of starch.

Experiment 3d.—A cold infusion of an ounce to a pint was made and filtered; to about an ounce of this infusion was added a saturated solution of corrosive sublimate, causing a flocculent precipitate.

Several ounces of the infusion were then boiled in a matrass; this somewhat diminished the clearness of the infusion, and after being set aside for several hours, a slight precipitate had deposited.

Experiment 4th.—An alcoholic tincture (2 oz. to 1 pint) had a deep red color and an exceedingly persistent bitter taste. An ounce of this tincture thrown upon some water, a considerable amount of resinous matter deposited, which on being collected and after being kneaded in water, presented all the appearance of resin, and which when applied to the heat of a lamp, instantly fused and ran down in drops, while a portion took fire and burned with much smoke.

Experiment 5th.—Two ounces of the coarsely powdered bark were thoroughly exhausted with alcohol of .835, then by evaporating this tincture there was produced 195 grains of extract, of an intensely bitter and aromatic taste. To the powdered bark, after being exhausted with alcohol, and while it was still in the percolator, cold water was added until it passed nearly colorless;

this watery solution upon being evaporated on a water bath, yielded 135 grains of extractive, of a comparatively feeble and bitter taste. This I take to be extractive matter, because the other constituents, gum and albumen, that are soluble in water, exist in the bark in such minute quantities that they could not make bulk of the extract, so that the greater part of the watery extract may be properly considered extractive matter.

Experiment 6th.—Two ounces of the finely bruised bark were exhausted with alcohol, and the tincture evaporated, yielding 195 grains of extract having a very bitter taste and an aromatic odor. The bark, after being treated as above, was thoroughly dried and treated with ether. The ethereal tincture had a light sherry wine color, and upon being evaporated produced 35 grains of a light colored semi-fluid extract. This extract has a very bitter taste and a greasy feel. It was partially soluble in alcohol; paper being imbued with it burned brilliantly; a portion of it, after being exposed on a glass plate in a drying closet for a week, still retained its semi-fluid consistence. This I pronounce fixed oil, mixed with a small portion of resin.

10 grains of this extract were boiled with one fluid drachm of alcohol of .835, and decanted from the insoluble portion while hot; on cooling it let drop a precipitate of a flaky appearance. These flakes on being separated were almost completely soluble in cold ether, entirely when the ether was warmed. They are entirely soluble in chloroform, also in olive oil; when applied to the heat on the point of a knife it first fused, then took fire. This substance I concluded to be wax.

Experiment 7th.—200 grains of the powdered bark were exhausted with ether and evaporated spontaneously, produced 30 grains of extract, composed principally of volatile oil, resin and fixed oil; had the consistency of a thick oil; its taste is very bitter and acrid, leaving a tingling sensation on the tongue, not unlike that occasioned by pyrethrum. The amount of volatile and fixed oil is remarkably large for a bark.

Experiment 8th.—1000 grains of the coarsely powdered bark were incinerated in a crucible, the unconsumed product weighing 140 grains. A strong solution was made from the ashes, with boiling water and filtered. The solution had a very alkaline taste, and effervesced with acids. To a portion of this solution

were added a few drops of a strong solution of tartaric acid with no immediate change; but on allowing it to stand for twenty-four hours beautiful transparent crystals of bitartrate of potash were formed. To another portion of the solution a stream of carbonic acid was passed, it produced a white precipitate. Oxalate of ammonia threw down a precipitate of oxalate of lime.

Experiment 9th.—300 grains of the ashes were digested in diluted sulphuric acid and filtered; to this solution was added a strong solution of ferrocyanate of potassa, but no satisfactory indication of iron was given.

Experiment 10th.—100 grains of the ashes were treated with diluted muriatic acid until all that was soluble was taken up. The solution was again filtered and a saturated solution of carbonate of ammonia was added in excess. The solution was again filtered to separate the carbonate of lime. The solution was then boiled some time, but it retained its transparency. After it had cooled down, a solution of phosphate of soda was then added, which caused a considerable precipitate of phosphate of magnesia.

The residue that remained in the filter after treating the ashes with muriatic acid amounted to 22 grains. This was boiled with liquor potass and filtered. Muriatic acid was then added to excess. Solution was then evaporated in a capsule to dryness, and the heat was raised to about 600° F. After it had cooled, the mass was dissolved in water and a whitish flocculent matter settled to the bottom. This I take to be silica.

Experiment 11th.—Twenty grains of hydro-alcoholic extract were rubbed with a few drops of liquor potassa, when an amount of ammonia was given off quite perceptible to the smell. Before I had completed the above experiment, my attention was called to an article by Dr. Ure (*Pharm. Jour.*) upon a bark he supposed to be the malambo matias. The result of his experiments agree so closely with those I had made that I am forced to believe that the barks are identical.

The bark contains, 1, a volatile oil; 2, gum; 3, starch; 4, albumen; 5, resin; 6, extractive matter; 7, fixed oil; 8, wax; 9, potash; 10, lime; 11, magnesia; 12, silica.

Dr. Ure, in speaking of the so-called malambo bark, says it

is from three to four lines thick, brittle, though somewhat fibrous; emitting, when freshly bruised, an aromatic odor not unlike that of the *acorus calamus*; it is of a brown hue, covered with an ash colored tuberculous epidermis; it possesses a bitter, pungent taste. Heated along with hydrate of potash free ammonia is disengaged, indicating the presence of an azotized principle. With water it forms an agreeable bitter infusion. With alcohol a powerful bitter tincture. Ether extracts from it a volatile oil and resin. It is without astringency. It appears to coincide, as suggested by Mr. Guibourt, both in regard to physical and sensible qualities, with *malambo*, the Indian name for the bark of a tree which grows in New Grenada, and which is held in high esteem by the natives as a febrifuge and stomachic. *Malambo* bark was analyzed by M. Cadet de Gassicourt about twenty-eight years ago. (*Jour. de Pharm.* tom. ii. p. 172.) Subsequently by M. Vauquelin, who ascertained the presence of three distinct substances, namely: an aromatic volatile oil; 2, a very bitter resin; 3, an extract soluble in water, which yielded ammonia when heated with caustic potash. (*Annales de Chem.* tom xcvi. p. 113). It afforded no tannin, scarcely a trace of gallic acid and none of the alkaloids of cinchona. It is stated that in countries where this tree is indigenous incisions are made in the bark, and there exudes an aromatic oil which sinks in water. Most of the authors believe it to be the produce of a species of *drimys*, but Bonpland regards it as a *quassia* (*Merat de Lens, Dictionnaire de Mat. Med.* tom. iv. p. 99).

This, however, is impossible, since none of the *quassia* tribe yet discovered are possessed of aroma. The above Columbian bark has frequently been administered by me as a substitute for cinchona with good effect. It offers the useful combination of a tonic and an aromatic, and seems to exercise its influence on the principle last laid down by Professor Shultz with regard to other therapeutic agents of the same class, namely: of increasing the flow of bile, whereby digestion is perfected and healthy blood formed. In scrofulous ophthalmia, after removing flocculent accumulations from the bowels, I have known an infusion made with $\mathfrak{z}\text{ij}$ of the bark to Oj of water, cause a speedy and complete removal of the inflammation and morbid sensibility of the eyes. The dose of the infusion just mentioned is from one to two

ounces, repeated twice or three times in the course of the day. It may in some instances be advantageously conjoined with salts of iron or of mercury, with both of which it is compatible. The addition of a little syrup of orange peel and compound tincture of cardamom forms a draught by no means disagreeable.

Conclusion.

This article furnishes a key in part to the subject under consideration, though it is not quite so conclusive as it could be desired. That the bark is the same as that which Dr. Ure speaks of does not admit of a doubt, but whether it is positively the malambo matias or not remains to be determined, but yet we have every reason to believe that it is so. Owing to the fact that no botanical history of the tree furnishing this bark could be found anywhere, which I regret exceedingly, the true name of the bark could not be satisfactorily settled. It is evident from these sensible properties that it possesses valuable medicinal qualities, combining, as it does, the agreeable aromatic with the powerful bitter properties. It is to be hoped that physicians and others having it in their power, will take hold of this bark and test its remedial powers, and give it such a place in the materia medica as its merits may justify.

REMARKS ON CHLORINE WATER.

By DR. EDWARD STIERON, Tarentum, Alleghany County, Penna.

The editors of the Dispensatory of the United States (10th edition, Philadelphia, 1854), have given two different methods of preparing chlorine water, one is called the Dublin, the other the Edinburgh method.

According to the Dublin method, chlorine gas is expelled from a mixture of peroxide of manganese and muriatic acid, and the gas absorbed by a certain quantity of distilled water; according to the Edinburgh method, certain quantities of chloride of sodium, of red oxide of lead, of sulphuric acid, and of water are put in a bottle with a glass stopper, and occasionally shaken. Then, after the red color shall have changed almost white, the insoluble matter will be allowed to subside before using the liquid.

By the Dublin method, the true and pure solution of chlo-

rine will not only be obtained, but the preparation will succeed more quickly than by the Edinburgh method, although the conscientious pharmacopolist may be put to the trifling expense of a gas-bottle and two suitable glass tubes; the apparatus itself, with a little care, may be used for a long time.

The preparation of the chlorine water by the other, or Edinburgh method, is under all circumstances objectionable, notwithstanding the language of the Dispensatory, page 894,—“containing a little sulphate of soda, which does not interfere with its medicinal properties;” it contains this solution of chlorine with the sulphate, and other things which it ought not to contain; and in its internal or external application, effects may be produced very different from those looked for by the physician, who thinks he is using a pure article instead of a very impure one.

The chlorine water strictly made according to the Edinburgh formula, contains *no lead*, and according to repeated experiments recently made by me on various samples of the article obtained from a drug store, contains also free sulphuric acid, copper, *etc., etc.* The red oxide of lead always contains copper in varying quantities, and which may be seen, page 574 of the United States Dispensatory, under the article “Plumbi Oxidum Rubrum;” it even constitutes a material portion of the chlorine water prepared by this objectionable method. I have found in one ounce of this solution of chlorine:—

9.0920 grains of NaO, $\text{SO}_3 + 11.4637 \text{ HO} = 20.5557$ grains of NaO, $\text{SO}_3 + 10 \text{ HO}$,
 5.8420 “ $\text{SO}_3 =$ to 7.688 $\text{SO}_3 + \text{HO}$ at 1.842 sp. gr. $\left\{ \begin{array}{l} \text{Sulphuric acid of} \\ \text{commerce.} \end{array} \right.$

0.0200 of a grain of NaCl,

0.342 to 0.443 of a gr. of CuO $\text{SO}_3 =$ to from 0.563 to 0.695 of a gr. $\text{CuOSO}_3 + 5 \text{ HO}$,

Traces of sulphate, of peroxide of iron, of chloride of iron, of chloride of copper, of sulphate of lime and of sulphate of magnesia. The two last derived from the impurities of the muriate of soda, that is, from the chloride of sodium and chloride of magnesium, contained in it.

The presence of copper can be easily detected by evaporating chlorine water a little in a dish of glass or porcelain, and then adding a solution of any caustic alkali as long as the liquid reacts still a little acid, and then by putting into it a polished iron rod, on which the copper will be precipitated in a metallic state; or a little more caustic ammonia may be added to the

chlorine water, over and above what may be necessary to precipitate the oxide of iron, *etc.*, then the liquid being filtered, and then slowly heated to expel the excess of ammonia, or neutralized by adding nitric acid. By adding a solution of ferrocyanate of potassa, a red precipitate will be formed, or at least it will show a red color, according to the greater or less quantity of copper contained in the liquid. If it be desired to ascertain the exact quantity of copper, then sulphuretted hydrogen gas must be passed through the chlorine water, the sulphuret of copper thus formed must be decomposed and oxidized by using nitro-muriatic acid, and the copper is to be precipitated from the filtered solution by caustic potassa. The oxide of copper now obtained, must be edulcorated, exsiccated, ignited and weighed.

According to my judgment, the Edinburgh formula for making chlorine water should be expunged from the Dispensatory of the United States, and apothecaries should only be allowed to prepare the article according to the Dublin method. *Sapienti sat!*

ON THE ACTION OF IODIDE OF STARCH ON VARIOUS SALTS.

By M. F. PISANI.

Iodide of starch poured into solutions of various salts, is decolorized in certain cases, whereas in others its blue color is unaffected. Thus, the salts of silver immediately decolor iodide of starch, but those of lead and copper have no action on it. The metals, besides silver, which produce this decoloration are—mercury, tin (stannous salts,) antimony (the chlorides,) arsenic (arsenious acid and chloride, As Cl^3 ,) gold (perchloride,) iron (ferruginous salts,) and manganese (manganic salts.)

Iodide of starch enables us at once to distinguish the mercurous from the mercuric salts; for with the mercurous salts, there is decoloration, at the same time that the yellow iodide is precipitated, whereas with the mercuric salts there is decoloration without the formation of any precipitate.

Stannous and stannic salts, likewise behave quite differently with this reagent. Thus, the first alone have the property of causing it to lose its color. Arsenious acid and its correspond-

ing chloride, likewise decolor iodide of starch. With arsenic acid there is no decoloration.

If we bring to the maximum of oxidation by nitric acid the metals which decolor iodide of starch, silver and mercury are the only two which retain that property. This decoloring action of these two metals on iodide of starch is easily explained in another manner, their great affinity for iodine. Vauquelin observed, that in triturating nitrate of mercury with iodine, iodide of mercury was formed, and probably also iodate. It is only necessary to place a crystal of iodine in a solution of mercuric nitrate to see the red iodide form on its surface, and the same time a still lighter white powder appears, which is the iodate. I have observed the same reaction with iodine and nitrate of silver; when put in contact with this salt, the iodine is quickly surrounded with a yellow aureola of iodide, the quantity of which gradually increases.

M. Deville has shown how strong an affinity exists between silver and iodine, since under the action of hydriodic acid the chloride of silver itself is decomposed. But the most curious thing is, that iodide of starch agitated with chloride of silver, very readily yields its iodine to it, and transforms it into iodide. Chlorine is found in the filtered liquor, and the blue color has disappeared.

Iodide of starch is the most sensitive reagent for ascertaining the presence of silver, should no mercury be present. Thus, in 100 c. c. of liquor containing $\frac{1}{10}$ th of a milligramme of silver, a cubic demicentimetre of iodide of starch produces decoloration, whereas the same quantity produces perceptible coloration in 100 c. c. of pure water. In a smaller volume of liquor, we can recognise the presence of a $\frac{2}{100}$ of a milligramme of silver with iodide of starch.

We can instantly discover the presence of silver in commercial lead, by dissolving it in nitric acid, letting the liquor cool and then pouring in a little iodide of starch. The excess of acid must be previously saturated with carbonate of lime, so that it should have no action on the iodine. A similar quantity of lead, containing no silver, becomes perceptibly colored by the addition of a few drops of this solution.

In these experiments I have used the soluble iodide of starch, prepared by Dr. Quesneville.—*Chemist, from Comptes Rendus.*

THE GUMS AND RESINS OF COMMERCE.

By P. L. SIMMONDS.

(Continued from page 142.)

MASTIC is derived from the *Pistacia lentiscus*, a very common shrub in various parts of Northern Africa, where it is sought out for its resinous produce.

In the island of Chios, where the tree is cultivated for the sake of the resin as carefully as the vine, it is customary to make small incisions in the trunk and chief branches, about the end of July. From these clefts the sap, which gradually thickens, exudes; it hangs in larger or smaller drops, and when it is very abundant, trickles on the ground and dries there. It is detached from the tree by means of a very sharp instrument; often it is caught upon cloths spread under the trees, in order to prevent any soli being derived by contact with the ground.

The largest consumption of mastic is in the East, where it is universally chewed, and thence derives its name. It is asserted to be effectual in whitening the teeth, strengthening the gums, and sweetening the breath. Mastic is also used in the preparation of the finer varnishes for pictures, &c. Owing to a recent more extensive demand for France and deficient supplies, this gum has run up in price considerably, being now vended at about 1s. 6d. the ounce. As much as 1500 cwt. was formerly annually exported from Chios. Dissolved in alcohol, mastic forms a very useful cement. It is obtained in Brazil, from the *Pistacia Atlantica*, and in Beloochistan and Affghanistan from other varieties, *P. Kinjuh* and *P. Cabulica*.

Most of the Eucalyptus genus in Australia furnish gum in abundance, particularly the red, spotted, and white gum, the iron and stringy bark and other trees. It exudes both spontaneously and in larger quantities when incisions have been made in the trunk, more particularly after rain. It is seen in masses upon the trunk, but its particles have so little tenacity, that when in a concrete form any attempt to detach them in one entire lump fails, and it crumbles immediately into innumerable fragments.

This gum resin has a strong astringent quality, and is one of the varieties of the kino of commerce.

At first it is of the consistence of very thick syrup, and immediately after rain may be seen flowing from an incision or cleft

in the tree very abundantly, being then of a beautiful bright red color, becoming of a dark shining red, and hardening by exposure to the air.

The *Angophora lanceolata*, or apple tree of the colonists, (a genus allied to that of *Eucalyptus*,) also yields a dark and astringent gum from its trunk and branches. A gum as fine as amber exudes from the stem of a *Macra Zamia* in Australia.

The KOWRIE GUM of commerce is the produce of *Dammaris Australis*. For a long time it was much neglected, and the shipments made to this market did not repay the cost of its collection in the colony. The Americans, however, purchased it readily at first for £16 to £20 the ton, and it was used by them as a substitute for copal in the manufacture of varnish. From 14 to 17 tons come in annually to Liverpool, and within the last year or two it has been in greater favor in the London market, and larger supplies are coming forward. In 1851, 16½ tons were shipped from the port of Auckland, and in 1852, 107½ tons. This resin may be obtained in any quantity in the northern districts of New Zealand, ranging from twenty miles south of Auckland to the North Cape.

The Kowrie pine grows to a gigantic size. The gum resin exudes from it, and bears some resemblance to the dripping of a wax candle in the wind. It is now in demand for the manufacture of varnish and other purposes, and it is found in masses of several pounds weight. The Kowrie gum, though clearly the produce of this tree, is dug from the ground in quarters where no traces of trees now exist. The gum-diggers probe the soil with long iron spikes, and extract the gum thus indicated from generally a couple of feet below the surface. These pieces of gum are probably the relics of primeval forests, which have disappeared long ago. The resin streams copiously from the stumps of the trees which have been felled, covering them with an appearance like wax, and hardening in the air.

BOTANY BAY GUM is a yellow resinous exudation from the *Xanthorrhœa hastilis*, and other species of the grass tree of Australia, which were generically named by Swartz, from this peculiarity. It is darker than gamboge, and less uniform in appearance, and not entirely soluble in alcohol. It has been used medicinally, to unite the edges of wounds, and in the form

of tincture, with opium, in dysentery and diarrhœa, and also forms the base of a cement. This resin contains benzoic and cinnamic acid. Another species of the same family, *X. Australis*, furnishes a more brittle resin, of a brilliant dark red color, known in the colony as "black boy gum." These resins are spoken highly of as useful for varnish, and as substitutes for shellac. The grass tree is one great characteristic of the scenery and of the vegetation of Australia. It puts one in mind of a tall black native, with a spear in his hand, ornamented with a tuft of rushes. On the spear is found an excellent, clear, transparent gum, and from the lower part of the tree oozes a black gum which makes a powerful cement, used by the natives for fastening stone heads on their hammers. This gum resin may be obtained in inexhaustible quantities.

Capt. Wray, R. E., submitted a report to the local authorities of Western Australia, last year, on the manufacture of illuminating gas from the Xanthorrhœa, at one-third the expense of lighting with oil or candles.

The plant grows in abundance all over the colony, and is composed of a core of hard fibry pith, about half of its whole diameter, round which there is a layer of resin, varying from half to one inch or more in thickness, which forms the connexion between the leaves and the core. Between these leaves, and also adhering to and covering them, is a considerable quantity of resin; resin also exudes in large lumps from the sides of the plant.

Method of obtaining the material.—In the first instance, the leaves and resin were separated from the core, by breaking up the plant with an axe, and sifting the resin from the leaves, but it was found by experience that as much gas was obtained from an equal weight of the leaves and resin together, as from the resin alone. The quantity of resin obtained from an average sized "black boy" was about 45 lbs. weight. This was collected easily, at the rate of 5 lbs. per hour, by a person having for his tools an axe and a sieve.

Should the resin be collected for export, I am satisfied that by a proper arrangement of crushers and sieves, a laborer, at 4s. per diem, (the colony rate,) could collect at least one hundred weight per diem, enabling the resin to be brought to market, at

Freemantle, for £4 per ton, the ton weight measuring forty-five cubic feet when pressed. The quantity of gas obtained by Capt. Wray's experiments, was at least four cubic feet to the pound of resin and leaves, but much more might be obtained by a more complete apparatus.

A cart load of the plants, 8 in number, weighed 1048 pounds. When the core was removed the leaves and resin weighed 628 pounds. This core is very good fuel when mixed with other wood. The specific gravity of the gas is 888. The products of the distillation are gas, tar, and coke. The tar obtained was about 1 quart for every 10 lbs., and this, when re-distilled, gave 8 per cent. fluid ounces of naphtha, and 20 per cent. of a sweet spirituous non-inflammable liquor. The coke remaining was about $\frac{1}{2}$ of the original weight, and with other fuel burns well. The coke of the leaf has a bright shining appearance, and when ground with oil is a very good substitute for lamp black in paint. The gas has a smell somewhat similar to coal gas, not nearly so offensive, but sufficiently strong to make any escape immediately perceptible. Its illuminating power appears to be very superior to coal gas, and its light very white.

Captain Wray is of opinion that when the production of the gas from the resin of the Xanthorrhœa is conducted with suitable apparatus, the cost per annum will be materially reduced, so far indeed that the resin may become a large and profitable export from the colony to places which are not lit at all, or lit with oil. Among these may be enumerated Singapore, Hong Kong, Melbourne, and Adelaide.

The supply is, I may say, unlimited, and even were it is not so, it would be advantageous to get rid of the plant from all the land fit for cultivation. Should, however, it be found that the plant was likely to get scarce, the resin might be obtained by tapping.

The gum resin of the New Zealand flax (*Phormium tenax*) is admirably adapted for sealing letters, and when remittances are enclosed, is frequently made use of by the colonists for that purpose. It is insoluble either in water or spirit, and so thoroughly penetrates the envelope as to become part and parcel of it, nor is it possible to get at the contents of a letter so sealed.

One of the gum trees of Popayan in Colombia yields a resin so

remarkably tenacious, that when used to varnish ornamental work it resists the application of boiling water, or even acids, for which reason tables, cabinets, &c., made by the Indians, and lacquered with it, are highly valued at Quito.

At Copiapo a resinous gum is obtained from the branches and berries of a shrub, with a leaf like the rosemary. It is made into cakes of two feet long, by one foot thick, and is used for paying of ships, glazing the earthen jars of the country, &c.—(*Frezier's Voyage*.)

Thenethea, the produce of an undescribed plant, is used by the Burmese as a coating for umbrellas and as a varnish.

The resins of Algiers are those from the terebinthe cedar, juniper, *Pinus halepensis*, of which there are large forests, *Thuya articulata*, and lentiscus, alk or lek, sanderic, mastic, and pitch and tar.

In 1853, France imported over 3 millions kilogrammes of resinous substances, valued at 1,844,337 francs.

SANDARAC is obtained from the *Callitris quadrivalvis*, Rich., the *Thuya articulata*, Wal. This tree furnishes the highly prized citrus wood of the ancient Romans; and the Thuya wood of Algeria has recently again come into high repute among the French cabinet-makers. Experiments for cultivating it on a large scale are now being carried out in the French African provinces.

It should be remarked that under the generic name of Thuya, various coniferous trees furnishing resin are confounded in Algeria. Sandarac is used in the preparation of varnish, and also for making pounce.

At the Paris Exhibition a light and transparent hard resin, from Coorg, was shown, of which I have a specimen on the table. It is said to be soluble in spirit, and suited for coach varnish, but Mr. Wallis does not speak well of it. The piney varnish of the *Vateria Indica*, is a kind of dammer, which is too soft for general purposes. An Assam resin, unnamed, is also a species of dammer, on which spirits of wine has little or no action.

The Gaub tree resin from Beerpoor is a very dark amber color, which melts lighter in color by heat, and mixes with oil. There is also a more transparent lighter variety shown from Calcutta.

According to my correspondent, Mr. Ondaatje, a black resin

is produced by a tree growing in the more barren parts of the district of Ceylon, in which he resides (Badulla), and belonging to the Anacardiaceæ, a tribe of plants which abounds in black resinous juice, whence the black varnishes used in China and India are obtained. It would seem to be the *Semecarpus obovatum*. From natural fissures of the bark, there runs out a clammy juice, which, at first white, becomes afterwards black by exposure to the sun's rays, hardening into masses of different sizes with pieces adhering. The resin is hard, breaks with a smooth shining fracture, burns with a bright flame, melts in fire, and is soluble in turpentine, insoluble in water, and adheres strongly to wood and metal. It is free from acidity. It forms a superior black varnish when added to a saturated solution of vateria resin, or East Indian copal, in oil of turpentine.

Two specimens of Ceylon resin, which I have here from the Paris collection, are merely species of dammer.—*Jour. Frank. Institute, from Jour. Society of Arts, London, 1855.*

(To be continued.)

ON WILD SENNA.

By DR. CARL MARTIUS.

At the meeting of Apothecaries held at Munich, Dr. Walz exhibited, under the name of *Wild Senna*, some leaves which had come into his possession, and with which none of those present was acquainted.* At the meeting of Naturalists at Vienna, these leaves were also exhibited by Dr. Walz, as *Folia Coluteæ*. More recently I have received the August number of the *Neues Jahrbuch für Pharmacie*, in which, at page 87, a notice on the subject occurs from the pen of the same *savant*. His examination into the origin of these leaves led to no definitive conclusion. The supposition that *Coriaria myrtifolia* might afford them, was disproved by a comparison with that plant as growing in the Botanical Garden at Heidelberg,—although some of their physical characters, such as smell and taste, seemed to favor such an opinion. The question was not that of the *adulteration* of Senna

* Augsburger Allgem. Zeit. Beilage, v. 5, Aug.—Archiv d. Pharmacie, October, p. 100.

with broken Coriaria leaves, as noticed by Peschier,* but of a substance which of late is brought as *Wild Senna* from France to Germany for a secret technical purpose, *tanning*, as it is supposed, and which by chance might give rise to errors and adulteration.

About this time my father, Dr. Theodor W. C. Martius, obtained a small sample of this *Wild Senna*, which was designated *Folia Coluteæ*. The coriaceous, smooth, dull-green leaves have a peculiar aromatic smell, reminding one of fresh Willow Bark, and an astringent, very bitter taste; they are mixed with mature and immature flowering heads, and with pieces of stick. Broken acorn-shells, single leaves of *Pistacia lentiscus* L. and of *Rosmarinus Hispanicus* L., occur also as admixtures. The leaves of this *Wild Senna* vary in size and form. The smallest are but a few lines long, and at broadest but 2 lines; the middle-sized are about 6 lines long and from 3 to 4 broad; the largest seldom exceed 10 lines in length by 4 lines in breadth. The leaves are entire; some obovatelanceolate, some lanceolate, and some lanceolate-cuneate, narrowed at the petiole, and terminated with a point or *mucro*. This *mucro*, a continuation of the mid-rib, is most evident in the lanceolate leaves—least so, and apparently often wanting, in the oval leaves. Together with these three forms, there often occur trident-pointed leaves 6 to 8 lines long, and $2\frac{1}{2}$ to 4 lines broad. The epidermis is firm and thick; the mid-rib visible on both sides (more clearly on the under), and evidently protracted into a point; the lateral veins are three in number, and indistinct. On the surface viewed with a lens numerous white points (*Spaltöffnungen*,) which Kosteletzky† and others appear to have taken for glands, are perceptible. The phyllaries of the flower-head are delicate, scarious, brown, ovate, standing around the grey, hairy calyx; the stalk is angular and striated, and with axillary glands. This description applies exactly to the leaves of *Globularia alypum* Linn., whose employment for the adulteration of Senna Leaves, improbable as it appears, has yet frequently occurred, as has been stated by my father in his *Pharmacognosie*, p. 161.

Globularia alypum Linn., (*Globulaire Turpith*, *Boulette*,

* Trommsdorff Journal, 1828. Bd. 16, p. 57 and 64.

† Allgemeine medizinisch-Pharmaceutische Flora. Bd. 3, p. 873.

Turpith blanc, *Senna of provence*, called by the Spanish *Segulada*, and by the Greeks of Zante Σενν) belongs to the Linnean class *Tetrandria*, order *Monogynia*, and the natural family *Globulariace* of De Candolle. It occurs in the region of the Mediterranean as a perennial shrub of from 1 to 2 feet in height. After a comparison with a botanical specimen in the herbarium of Professor Schnitzlein, my honored tutor, who on this occasion assisted me with his usual kindness, I found that the smaller of the leaves which I have described, were attached to the stalks and short twigs of the lower part of the shrub, while the tridentate larger leaves are those of the flowering shoots.

The *Globularia* was known in the middle ages as a purgative, and was, as Geiger states, introduced into medicine under the idea of it being the "ἄλυσον of Dioscorides, a plant whose fruit was anciently used as a purgative. Lobel, Dalechamp, and Bauhin regarded the *Globularia* as so violent a remedy, that they termed it *Frutex terribilis*. Clusius figures it in his *Historia* under the name *Hippoglossum Valentinum*, and states besides, that in Spain it is called *Coronilla de Frayles*, i. e. *Coronula fratrum sive monachorum*. Clusius, Garidel, and especially later writers, as Nissole (1712) and Ramel (1784) have endeavored to prove its harmlessness as a simple purgative, and Ramel has even lauded it as a febrifuge: nevertheless, both De Candolle and Gilibert (1806) pronounce it a violent drastic. Loiseleur-Deslongchamps, however, after a trial of the leaves upon twenty four patients, came to the conclusion that the remedy was a mild evacuant, preferable even to Senna, since it had not the repulsive smell and taste of that drug; it acted less violently, and less frequently occasioned griping. The doses given were from 48 to 100 grains in decoction.

In the *Dictionnaire Universel de Matière Médicale* Mérat and De Lens,* *Coronilla emerus* L. is given as the origin of *Sené Sauvage*, as well as of the leaves known as *Sené Bâtard*, or *Faux Baguenaudier*. That the leaves which I received were neither those of *Coronilla* nor of *Colutea*, it is needless further to insist upon. It shows, however, that there are two kinds of *Sené Sauvage*, or *Wild Senna*, viz., the leaves of *Coronilla*

* Tome vi., p. 387.

emerus L., known in France, and those of *Globularia alypum*, occurring in Germany. Whether our drug, which there is reason to think may be from the same source as that of Dr. Walz, is really identical with his, will soon be determined.

A chemical examination, I regret to say, could be but very superficially performed, owing to my time being previously engaged with other chemical researches. The brown decoction, however, had a strong acid reaction, and not disagreeable odor of Willow Bark, and an intensely bitter quinine-like taste. Solution of baryta and acetate of lead precipitated a yellowish coloring matter, which appeared of the same nature as that found in Rhubarb and in *Rhamnus frangula*. The decoction also contained gallic and tannic acids, besides some indifferent extractive matter.

It was remarkable, that after two extractions with water, the leaves became completely black. In conclusion, I may express the hope that Dr. Walz may, by a chemical analysis and the isolation of the crystallizable bitter substance which he has discovered, succeed in completing our acquaintance with this so-called *Wild Senna*.—*London Pharm. Jour.*, February, 1857.

ON QUINIDINE.

By J E. DE VRY, Ph. D., Rotterdam,

Honorary Member of the Pharmaceutical Society of Great Britain.

In the year 1853, Pasteur found that the substance called *Quinidine* was a mixture of two crystallizable alkaloids, each of which had a different rotatory power when observed in the polarizing apparatus.

The greater part of the mixture was lævogyre, and the crystals were not altered in the air. With chlorine and *liquor ammoniæ* no green coloration was observed. To this part of the mixture, Pasteur gave the name of *Cinchonidine*.

The smaller part of the mixture was *quinidine*; it was dextrogyre and isomeric with quinine. The crystals were efflorescent in dry air and very soon became opaque. With chlorine and *Liquor ammoniæ* they showed the same green color as does quinine when similarly treated.

Although the mixture which Pasteur examined, consisted of

cinchonidine and *quinidine*, my own observations have shown me that the greater part of the so-called *quinidine* met with in trade has been, until recently, nothing else than *cinchonidine* containing more or less *quinine*. Thus, for instance, in the Paris Exhibition of 1855, there were several samples of so-called *quinidine*, and of its compounds, but I found them to be all mainly *cinchonidine*.

I am indebted to Mr. John Eliot Howard for having first supplied me with genuine quinidine, perfectly pure: soon after I had become acquainted with its properties, my friend M. Delondre also sent me several samples of true quinidine, in a state of greater or less purity. The quinidine of Mr. Howard was so pure, that I found the same rotatory power as Pasteur, viz. 250° ↗.

Although I am still occupied with the investigation of quinidine and the other cinchona-alkaloids, which investigation is not yet completed, I will not delay making known one property of quinidine by which it differs widely from the other three cinchona-alkaloids, because the knowledge of this property may be useful for the successful separation of quinidine from its cognate alkaloids.

Quinidine forms with hydriodic acid a salt which is very difficultly soluble. One part of *neutral* hydriodate of quinidine requires 1250 parts of water at 60° F. for its solution. The *acid* hydriodate is much more soluble, for one part is dissolved by 90 parts of water at 60° F. By this difficult solubility of its neutral hydriodate, the presence of quinidine can easily be detected. I was enabled by this reaction, together with the observation by polarized light, to prove undoubtedly that the so-called β *Quinine* of Van Heyningen is nothing else than *quinidine*. A few grains of β *Quinine* prepared by the late M. Van Heyningen himself, enabled me to prove this fact.

Although the sulphate of quinidine is sparingly soluble in cold water, the solution is nevertheless very strongly precipitated by a solution of iodide of potassium. I have no doubt that the manufacturers of quinine will be able by using this reaction, to find quinidine in many specimens of the so-called *quinoidine* or *amorphous quinine*, or, at least, in the mother-liquors obtained

in the preparation of sulphate of quinine.* In the hands of the scientific manufacturer, such as Mr. Howard, it may serve for the discovery of the barks which contain quinidine. If a bark contains quinidine, a tincture made with strong alcohol, will form crystals of hydriodate of quinidine upon the addition of a few drops of hydriodic acid and stirring the liquid with a glass rod. If quinidine is present, small crystals will separate, either immediately or after some hours, wherever the rod shall have rubbed against the glass.—*London Pharm. Jour.*, Feb. 1857.

NOTE ON THE COLCHICUM AUTUMNALE.

By L. OBERLIN.

In 1820, after the chemical examination of several plants of the family *Colchicaceæ*, MM. Pelletier and Caventou† assimilated the principle found in the *Colchicum autumnale* to that discovered by them in other plants of this family, and indicated the presence of veratrine in this plant.

In 1833, MM. Hess and Geiger‡ pointed out the difference which separates the active principle of the *Colchicum* from that contained in White Hellebore and Sabadilla, and described the physical and chemical characters of the alkali, which they called colchicine. I have resumed this investigation; but although I have carefully followed the process of extraction which they state they employed, I have not obtained a crystallizable principle, even by trying all the solvents to facilitate crystallization, and two chemists who have repeated the experiment at my request have arrived at the same result as myself. The following are the results of my researches upon this uncrystallizable product, obtained by the process of MM. Hess and Geiger.

The aqueous solution of colchicine, acidified by sulphuric or muriatic acid, acquires an intense yellow color when it is brought to a certain state of concentration on the sand-bath; it gives a

* This supposition has since been proved by the examination of quinoidine from the manufactory of Mr. Zimmer, from which I obtained 23 per cent. of hydriodate of quinidine.

† *Ann. de Phys. et de Chim.*, xiv.

‡ *Handwörterbuch der reinen und angewandten Chemie*, ii. p. 330.

yellowish-white precipitate with water; this precipitate, when well washed and freed from the coloring matter, is soluble in alcohol or ether, and crystallizes readily. A larger quantity of the product is obtained by employing muriatic acid, and allowing the reaction to take place spontaneously. After a few weeks, a great many warts with an acicular crystallization are found. These, when pulverized and well washed, furnish a nearly white product after the first recrystallization; whereas, when sulphuric acid is employed, white nacreous crystals cannot be obtained without great trouble, the resinous coloring matter which accompanies this product being got rid of with difficulty.

This crystalline principle is not a salt; it is neutral, and reagents do not indicate any trace of the acids employed in its preparation. I call it *colchiceine*, as it differs from the colchicine of Hess and Geiger, which, as I shall show, appears to be a complex product.

The properties of colchiceine are as follows:—It crystallizes very readily in nacreous lamellæ; it is almost insoluble in water, but communicates to this vehicle a slight bitterness, which is perceptibly increased by ebullition. At this temperature a considerable portion of the product is dissolved, but this is deposited immediately after refrigeration. The solvents of colchiceine are alcohol, ether, methylic alcohol and chloroform, which when in contact with it acquire a very intense and persistent bitterness.

The alcoholic solution of colchiceine is colored by the addition of bichloride of platinum, and no precipitate is formed. Pure and concentrated nitric acid dissolves colchiceine; it acquires a very intense yellow color, passes to violet, then deep red and bright red, and returns to its original yellow color.

Concentrated sulphuric acid dissolves it, forming a solution of a very intense yellow color, which is retained even after dilution with water; in course of time brownish flakes are formed. Muriatic acid dissolves it with a bright yellow color. Lastly, acetic acid also dissolves it, but without alteration of color.

Colchiceine is soluble in ammonia, and crystallizes by evaporation in the air; it is soluble in caustic potash, acquires a green color with perchloride of iron, and presents no change of color or turbidity in presence of solutions of neutral or tribasic acetate of lead, of nitrate of silver, of perchloride of mercury, or infusion of nut-galls.

Colchiceine appears to be capable of combining with baryta ; if saturated solutions of hydrate of baryta and colchiceine in methylic alcohol be mixed together, a voluminous precipitate is soon formed ; this is gelatinous and soluble in wood-spirit, and even in an excess of the solution of baryta.

Colchiceine is unalterable in the air, and has no action upon red or blue litmus-paper. When exposed in a tube to the heat of the oil-bath, it softens at first, and fuses at 311° F. ; if the temperature be raised, it becomes colored at about 392° F. When heated upon a platinum plate, it fuses, acquires a yellowish color, and burns, leaving only a trace of a spot which has no action upon moistened test-papers. When heated with caustic potash, it evolves a gas which renders reddened litmus-paper blue. When calcined with potassium, according to the process of M. Lassaigne, a residue is obtained, which, treated with a solution of a sesquisalt of iron and afterwards with muriatic acid, furnishes a blue liquid, the deposit from which is prussian blue.

The presence of nitrogen being proved by these two experiments, I submitted colchiceine to elementary analysis, with the following results :—

	Calculation.	Experiment (average).
C	62.83	62.669
H	6.60	6.560
N	4.19	4.298
O	26.38	26.473

Pre-existence of Colchiceine in the Seeds of Colchicum.—As this substance might be the result of the action of reagents upon the normal materials of the seeds of the *Colchicum*, I endeavored to ascertain its pre-existence, and believe I have succeeded by proceeding in the following manner :—

I dissolved the alcoholic extract of the seeds of *Colchicum*, previously freed from oil and starchy matter, in alcohol and decolorized it by well-washed charcoal ; after filtration, the charcoal was treated repeatedly with boiling alcohol, which was added to the first liquid. The syrupous extract which remained after distillation, when dissolved in water and slightly acidulated with very dilute sulphuric acid, gives rise to a flocculent precipitate ; the liquid, when filtered and left for some weeks, produces the warty crystals previously described. These crystallize in alcohol, and are identical with colchiceine.

The action of acids upon analogous bodies having given rise to decompositions producing peculiar principles and glycose, I endeavored to ascertain the presence of the latter in the mother-liquors from which the crystals of colchicine were deposited, but I only succeeded in isolating a resinous matter, insoluble in water, combined with some coloring matter and very soluble in alkalis, a product consequently of an acid nature. The characters of this resinous matter are, that it is soluble in alcohol and ether, acquires a blood-red color with nitric acid, and dissolves in ammonia, to which it also gives an intense red color.

Physiological Experiments.—According to experiments made by Prof. Schroff* of Vienna, the colchicine obtained according to the process of Hess and Geiger has a poisonous action upon rabbits even in doses of 0.01 grm.; the animal only dies in from twelve to eighteen hours. Given in large doses, even of 1 grm., it does not produce death in less than seven or eight hours. When colchicine is injected into the stomach in a dose of 0.01 grm., the animal does not die for ten or twelve hours, but in a dose of 5 centigrms. it causes a complete paralysis of the members and death in a few minutes.—*Chemical Gazette, March, 1857, from Comptes Rendus, Dec., 1856.*

ON THE PRODUCTION OF MANNITE BY MARINE PLANTS.

By Dr. T. PHIPSON.

It has been for some time known that certain marine algæ produce, when dried in the open air, efflorescences of mannite (sugar of manna) on their surface. Of this number are *Laminaria saccharina*, *D. digitata*, *Rhodomenia palmata*, *Fucus siliquosus*, *F. nodosus*, *F. vesiculosus*, *F. saccharinus*, *F. serratus*, &c. In 1855, I observed this production of mannite on many of these algæ (which are very common), and especially on the *Laminaria saccharina*, the *Fucus vesiculosus*, and its numerous varieties, the *F. serratus*. I have no doubt, that all the algæ which contain vegetable mucilage produce this substance, when in conditions favorable to its formation.

* Oesterreich, Zeitschr. für prakt. Heilkunde, June 6, 1856.

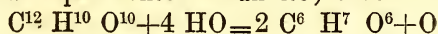
Some botanists have thought that the production of mannite, by marine plants, was in consequence of a *secretion* of the substance in question by the living plant; but I have proved that this saccharine matter is only produced after the vital activity of the plant has ceased. Moreover, my observations on this point lead me to believe, that the production of mannite is always the result of a peculiar kind of fermentation, which disoxidises the vegetable mucilage and transforms it into mannite.

We know that many of the marine algæ contain such large quantities of mucilage, that some naturalists have tried to render this production useful as a manufacture. For instance, Mr. Brown has found that prolonged boiling with dilute sulphuric acid suffices to convert this substance into *arabine* (gum arabic).

I have obtained very large quantities of mannite after removing the algæ from the water, by placing them still moist between sheets of grey paper, so that the access of air is not prevented, and leaving them there for eight days. At the end of this time, the surface is covered with an efflorescence of mannite. It is in this case formed more in the shape of grains than in crystals, but when dissolved in water, such as is furnished by the plant, it crystallises, by the evaporation of the liquid, in long, acicular and colorless tufts.

I account for its production in the following manner:—

Supposing that the mucilage has the formula attributed to it, $C^{12} H^{16} O^{10}$, and which represents the composition of this substance dried *in vacuo* at $130^{\circ} C.$ ($266^{\circ} F.$), we find that in the presence of water and losing one equivalent of oxygen, it may be divided into two equivalents of mannite; thus—



Veg. mucilage + water = mannite + oxygen.

It is, consequently, by means of a *disoxidising influence* exerted on the mucilage, that mannite is produced. This substance is likewise produced during viscid fermentation, as is well known, in which case a viscid matter is formed of the nature of the gums (in wine, beer, and vegetable juices as they spoil), and in these circumstances the mannite produced, proceeds evidently from the disoxidising action which the fermenting matter exercises on this viscid substance.

I have often observed, that the intercellular mucilage of ma-

rine algæ, being decomposed during the production of mannite, the superficial tissue of the plant is deteriorated; this is especially the case with *Laminaria saccharina*, one of the algæ which furnishes the most mannite; with the microscope we perceive, that the pulverulent and white layer of mannite is accompanied by a great many isolated spherical cellules, proceeding from the destruction of the plant; water put to them dissolves the mannite, and leaves these cellules at liberty. A piece on which there was no mannite, showed these same cellules in juxtaposition and implanted in the mucilage, forming a continuous smooth layer, which becomes pulverulent by the formation of mannite.

The body which causes the alteration of the mucilage in the algæ, is probably the albuminous matter which all these vegetables contain, and which decomposes in the air, causing, by prolonged decomposition, those disagreeable odors which characterize the putrefaction of the algæ, as well as those of fresh as of sea water.

The production of mannite: 1st, by marine algæ; 2d, by the viscid fermentation of wine and beer; 3d, by the decomposition of mucilaginous vegetable juices, such as those of the beet root, dog's grass, ash, &c., leads us to imagine that the origin of this saccharine matter is vegetable mucilage, rather than sugar, as many chemists have supposed. I think we may venture to say that wherever, in nature, there exists at once vegetable mucilage and a disoxidising action, mannite will be produced.

It appears probable, that the viscid substance produced during the decomposition of many beverages, and whose real nature has only lately been suspected, is nothing but vegetable mucilage of the formula $C^{12} H^{10} O^{10}$.—*The Chemist*, March, 1857, from *Comptes Rendus*, Dec., 1856.

AMYLENE; A NEW ANÆSTHETIC AGENT.

Dr. Snow, in a paper read before the Medical Society of London, on the 10th of January, and since published in the *Medical Times and Gazette*, has directed attention to amylene as an anæsthetic agent, and numerous trials of this substance for producing insensibility are now being made. In the paper alluded to Dr. Snow briefly traces the history of the introduc-

tion. He gives the following quotation from Sir Humphrey Davy's *Researches concerning Nitrous Oxide*, published in the first year of this century: "As nitrous oxide in its extensive operation seems capable of destroying physical pain, it may probably be used with advantage during surgical operations in which no great effusion of blood takes place." About forty years after the publication of this sentence nitrous oxide was used with doubtful success by Mr. Wells, a dentist, of Hartford, Connecticut, in some cases of tooth extraction: but its use was speedily relinquished, the effect being considered uncertain. In September, 1846, Dr. Morton, who had previously been in partnership with Mr. Wells, and had witnessed the trials with nitrous oxide, administered the vapor of sulphuric ether with success in a case of tooth drawing, and afterwards in surgical operations. This led to the general use of ether vapor. In 1847 Mr. Jacob Bell substituted the substance known as chloric ether for sulphuric ether, and this, although not sufficiently active, was found to produce insensibility. In the autumn of 1847 Mr. Waldie, of Liverpool, being in Edinburgh, explained to Dr. Simpson that the so-called chloric ether was a solution of chloroform in spirit, whereupon the latter obtained some pure chloroform and administered it with great success. Dr. Snow states, "Ever since the introduction of chloroform I have been of opinion that other agents would be met with more eligible for causing anæsthesia by inhalation. It seemed improbable that this one, which happened to be standing on the shelf of the Pharmaceutical Chemist for another purpose, should be better than all the very numerous volatile compounds which organic chemistry is daily bringing to light; and the continued use of chloroform is probably due to the circumstance, that hardly any one has made anæsthesia by inhalation a subject of constant and protracted investigation. I have from time to time made experiments on animals with a variety of substances, and I find that the agents which might be inhaled for the prevention of pain, in the absence of others which are more eligible, are extremely numerous. They include, among other things, carbonic acid and carbonic oxide gases, olefiant gas, the vapor of hydrocyanic acid, and cyanogen gas; which last is contained, as I found, in the fumes of the puff-ball, which Dr. Richardson brought before the notice of this Society. The

agents which I have exhibited as anæsthetics to the human subject, in addition to ether and chloroform, have as yet been but few. They are nitric ether, Dutch liquid, benzin or benzole, a bichloride of carbon, made by decomposing chloroform with chlorine gas, the monochlorinatted chloride of ethyle, and amylene, the subject of this paper. Nitric ether was exhibited also by Dr. Simpson, and Dutch liquid by him and Dr. Nunneley. These substances possess no advantage over chloroform, unless it be in their slower action, while in other respects they are scarcely so agreeable. With regard to benzin, I discontinued the use of it on account of convulsive tremors which it occasioned in a case of amputation in St. George's Hospital. I found that these tremors are a constant result when its effects reach a certain stage. I administered the chlorinatted muriatic ether in twenty surgical operations in the summer of 1851, chiefly in King's College Hospital. Its sensible and physical properties and its effects, are nearly the same as those of chloroform, but I thought that it might possess some advantage in the circumstance that, being less volatile, while its other properties are the same, it would be less liable to cause accident, even if incautiously used. I was, however, prevented from using it further, owing to the great difficulty of procuring it in a state of purity." He further states: "I was not aware of the existence of amylene till a few months ago, or I should have tried it sooner; for I made inquiry in 1848 for a substance named eupion, by Reichenbach, its discoverer, but was unable to obtain it. Eupion is a carbo-hydrogen, described as having all the physical characters which belong to amylene, though obtained in a different way, and I believe it is the same substance. Reichenbach obtained it from coal-tar, but other chemists have not been able to make it."

Dr. Snow describes several cases in which he has administered amylene, and says:

"The relative advantages and disadvantages of amylene may, as nearly as I can judge, be summed up as follows:—In regard to its odor, it is more objectionable than chloroform, but much less so than sulphuric ether. The odor of any volatile substance is, however, no longer perceived after a patient begins to inhale. In respect to its pungency, it has a great advantage over both ether and chloroform, being much less pungent than either of

them. Thus, whilst the patient, especially if a female, often complains of a choking feeling and want of breath, in commencing to inhale chloroform, and two or three minutes are lost before the vapor can be inhaled in any useful quantity, she can begin to inhale the amylene of full strength within half a minute from commencing, and the operation may generally be begun within three minutes. In the amount which suffices to produce insensibility, it is intermediate between chloroform and ether, chloroform having the advantage. Amylene has an advantage, in preventing pain with a less profound stupor than that occasioned by the other agents, and in the ready waking and recovery of the patient it has an advantage over chloroform, and a still greater advantage over ether. Its probable safety I have spoken of;* and the greatest advantage of all, if it should continue to be met with in all cases, is the absence of sickness from its use. The almost entire absence of struggling and rigidity may also be mentioned as an advantage of amylene over ether and chloroform."

Preparation and Properties of amylene.—Amylene was discovered and described in 1844 by M. Balard, of Paris. It is made by distilling fusel oil, or amylic alcohol (the only liquid which is separated from spirit of wine in the process of rectification,) with chloride of zinc. On adding the fusel oil to a concentrated solution of chloride of zinc while they are cold, solution or admixture does not take place, but on applying heat they mix and form a homogeneous liquid, which begins to distil at a temperature of about 266° Fah. On re-distilling the product thus obtained, the ebullition which commences at 140° Fah., rises during the process to about 570° Fah. The most volatile parts of this distillation are to be separated, and agitated with concentrated sulphuric acid, when the amylene in a pure state will rise to the surface. It is colorless, very mobile, and has a low specific gravity (stated by Dr. Snow to be 0.659 at 56° Fah.) Its boiling point is 102° Fah., and the density of its vapor is 2.45. It has a peculiar and disagreeable smell. Its composition is represented by the formula $C_{10}H_{10}$. It is soluble in alcohol and ether

* The author states, "While I cannot venture to predict for it the absolute safety which seems to attend sulphuric ether under all circumstances, I confidently trust that it will be perfectly safe with careful management."

in all proportions, but is very sparingly soluble in water. Specimens prepared by different manufacturers have been found to present some difference in their sensible characters, which probably arises from the circumstances that the fusel oil from which it is made is not a definite body of uniform composition, and that the amylic alcohol, the principal constituent of the crude fusel oil, is not easily isolated in a state of purity. Should it be found that amylene cannot be always obtained in an uniform state, this will be a serious obstacle to its successful employment as an anæsthetic agent.—*London Pharm. Jour.*, February, 1857.

IODIDE OF ANTIMONY.

Mr. W. Copney, of St. Mary's Hospital, brought this preparation under the notice of the Meeting. It had been recently introduced as a therapeutical agent at the hospital to which he was attached, and as it was a substance not met with in commerce, he had been requested by Mr. Ure, surgeon to the hospital, to prepare some of it. He had not found any detailed account of the process for making it in the books generally accessible to Pharmaceutists, and therefore thought that a few particulars on this point might be acceptable. After the trial of several methods for effecting the combination of the elements, which proved more or less inapplicable or inconvenient, he adopted the following as that which afforded the most satisfactory result:—

A quantity of metallic antimony, having been reduced to a coarse powder, was mixed gently with pure iodine, in the proportion of three equivalents of the latter to one of the former. The mixture was transferred to a Florence flask, and cautiously heated over the gas flame. Combination speedily took place, with a great and sudden increase of temperature and the liquefaction of the contents of the flask. By way of precaution the neck of the flask was lightly plugged with cotton wool, to act as a yielding impediment to the projection of any of the materials, or the escape of the vapor of iodine during the process. The heat being withdrawn, the flask was allowed to cool, then broken, and the contents removed.

Teriodide of antimony, thus prepared, was found to be a somewhat crystalline or foliated mass, having a semi-metallic appear-

ance. On scratching the surface the part became distinctly red. By trituration a deep orange-red powder was obtained. It readily fuses into a dark red liquid. By continuing the heat it is sublimed in the form of crystalline or plumose laminæ of a yellowish-red color.

Triturated or shaken with water, it became of a yellow color, this being a subiodide or oxyiodide resulting from the abstraction of iodine by, and in the production of hydriodic acid with the hydrogen of, the water; a behaviour analogous to that of the chloride of antimony when similarly treated.

The form of administration adopted was that of pills; the dose a quarter of a grain to a grain. As an outward application it was used suspended by means of mucilage.

An attempt was made to prepare a solution similar to Donovan's, substituting antimony for arsenic. As anticipated, the liquid refused to retain the iodide of antimony. It is probable, however, that with an excess of hydriodic acid, and by preparing a much stronger solution, a liquid of this kind might be prepared; but it is also probable that it would be impossible to make a mixture of it without its becoming decomposed.—*London Pharm. Jour.*, February, 1857.

ON THE OPTICAL CHARACTERS OF CERTAIN ALKALOIDS ASSOCIATED WITH QUININE, AND OF THE SULPHATES OF THEIR IODO-COMPOUNDS.

By WILLIAM BIRD HERAPATH, in a letter to Professor Stokes, Sec. R. S.

You will probably recollect that I sent you some time since a small portion of an alkaloid, which at that time was called quinidine in Germany, but it has since been distinguished from it and named cinchonidine. You then examined it for epipolism or fluorescence, and you pronounced the opinion that it possessed this property only in a minor degree, and you imagined that this arose from the presence of a small per-centage of α -quinine.

I have since obtained, through the kindness of Mr. J. E. Howard, specimens of the perfectly pure alkaloids quinidine and cinchonidine, and find that quinidine, which I can now identify as the β -quinine of Von Heijningen, possesses the phenomenon of fluorescence or epipolic dispersion as powerfully as α -quinine; whilst cinchonidine, if perfectly pure, is devoid of it altogether;

and recent experiments have shown me that a small per-centage of quinidine was the cause of the epipolic dispersion found by you in the specimen of cinchonidine sent by me.

It may be as well to state that the cinchonidine tested by water of chlorine and ammonia gave no evidence of green tint, which it would have done if only $\frac{1}{5000}$ dth part of either α -quinine or quinidine had been present, according to some recent experiments of my own.

I have also found that 1 gr. of pure quinine or quinidine in 35,000 of water will give an evident "*epipolic*" appearance; whilst when diluted with 70,000 grs. of water we have still very evident appearance of "fluorescence" upon the perpendicular wall of the glass vessel exposed to the incident light; whilst a bluish milkiness of "internal dispersion" may be seen when 1 gr. of either alkaloid is diluted with 700,000 grs. or 10 gallons of distilled water, well acidulated in all these cases with sulphuric acid.

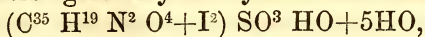
Some other interesting results have followed from these investigations. When quinidine is dissolved in an excess of diluted sulphuric acid, and the solution mixed with about twice its bulk of spirit, and warmed to 130° F., and tincture of iodine then added in sufficient quantity, and subsequently set in repose, beautiful red acicular crystals are deposited; these, upon recrystallization from rectified spirit, acquire an increased size, become beautiful quadrilateral prisms, leaving a deep garnet-red by transmitted light, and possessing a clear bluish-purple reflected tint; they are optically doubly absorbent in a slight degree, and transmit a brownish-orange body-color when polarized perpendicular to axis. The primary form appears to be a rhombic prism, and as far as my present analyses go, appears to possess centesimally the following composition:—

Iodine	.	.	.	.	.	39.665
Sulphuric acid	.	.	.	.	.	6.273
Carbon	.	.	.	.	.	32.890
Hydrogen	.	.	.	.	.	3.960
Nitrogen	.	.	.	.	.	4.400
Oxygen	.	.	.	.	.	5.040
Water	.	.	.	.	.	8.504

100.712

The excess arises from the hydrogen twice calculated in water of crystallization.

These numbers agree very closely with the formula



and prove it to be the sulphate of iodo-quinidine, very analogous to the optical quinine compound, yet differing materially in its optical properties.

There is another alkaloid frequently associated with quinidine, which also crystallizes from spirit in the prismatic form like quinidine and cinchonidine, but is another example of epipolism or fluorescence. Its iodo-sulphate is deep olive-green in its reflected tint, orange-yellow by transmitted light, and possessing in an eminent degree optically doubly absorbent powers, thin laminæ being quite black, but still thinner ones give a bistre-brown "body-color" when polarized perpendicular to axis.

This alkaloid was also furnished me by the kindness of Mr. Howard, but has not yet been sufficiently purified, or in the quantity necessary to give certain results.

It possesses one very peculiar property. When dissolved in chloroform and evaporated spontaneously on glass, the gummy and uncrystalline residue, mounted in Canada balsam, at once shows a deep blue-green, epipolic or fluorescent appearance.

Pure cinchonidine does not possess epipolic dispersion and does not become green by chlorine-water and ammonia; and when it is dissolved in acetic acid or chloroform and the fluid is exposed on glass plates to spontaneous evaporation, beautiful crystals in circular spots or drusæ develop themselves, which under polarized light exhibit black crosses and white or colored sectors.

These appearances are not exhibited by pure quinine or true quinidine (β -quinine), both of which give a gummy, uncrystalline, and perfectly transparent residue.

Pure cinchonidine, thus optically and chemically distinguishable from either quinine or quinidine, is still further remarkable for producing with sulphuric acid and iodine an optical doubly absorbent compound of intense power, even equal to the sulphate of iodo-quinine compound; these crystals are very similar in form to my artificial tourmalines, and have long been mistaken by me for them; even at present I can only distinguish them by

the tints in reflected light and the complementary body-color, viz., whilst sulphate of iodo-quinine gives a cantharidine-green reflected tint, and a pink, ruby-red, reddish-brown or black body-color when polarized perpendicular to the axis, according to the thickness of the plate examined, the sulphate of iodo-cinchonidine is golden-green by reflected light, and gives a sky or indigo-blue or black "body-color" when polarized perpendicular to the axis. I have not yet made sufficient chemical analyses of this substance to enable me to decide on its formula, but I have obtained 39.307 per cent. iodine and 8.864 per cent. sulphuric acid, which sufficiently indicate a chemical difference in constitution from the sulphate of iodo-quinine, which it may be remembered, contains 32.609 per cent. iodine and 10.61 per cent. sulphuric acid.

I hope soon to present these results in more detail when sufficient leisure is afforded me for the purpose.—*Chemical Gazette*, March 2, 1857.

ON GOLD IN THE FORM OF MALLEABLE SPONGE.

By D. FORBES, F. G. S.*

Of late years, gold in a peculiar state of aggregation has been imported from America for the use of the dentists, and sold at prices between £7 and £8 per ounce. The gold is in the form of flat cakes about two-tenths of an inch thick, and has a reddish-brown color and peculiar spongy texture.

By the force of the fingers it can be welded or kneaded into a pellet without crumbling, and becomes by the pressure of a tool nearly as solid as ordinary gold. It is therefore well adapted for dental purposes.

The process by which it is said to be made is patented in America, and consists in repeatedly dissolving, precipitating, amalgamating, heating, &c., so extraordinary that it is probably only put forward to deter others making it. On trial, gold of a similar spongy character was obtained by the following method:—

Gold free from copper is dissolved in nitrohydrochloric acid, keeping an excess of gold in the solution towards the close of the operation, so as to get rid of all nitric acid and avoid subsequent evaporation; any chloride of silver present is filtered

off. The solution of gold is now placed in a flat-bottomed vessel and heated, and a strong solution of oxalic acid added; in a few hours the whole gold is deposited, and the supernatant liquid may be decanted off, taking care all the time not to disturb the gold at the bottom, and the vessel is then several times filled up with boiling water and decanted until the last washings contain no more oxalic acid.

The gold is now carefully slipped on to a piece of filtering-paper, and by means of a spatula gently pressed into the form of the desired cake, but somewhat thicker; it is then removed to a porcelain crucible, and heated for a short time somewhat below a red heat, when it shrinks in dimensions, becomes coherent, and is similar to the American product in properties.

As the American gold is of a reddish hue, it is probably precipitated by protosulphate of iron, and not by oxalic acid.—*Chemical Gazette*, Feb. 1, 1857.

ON STORAX.

By DANIEL HANBURY.

“Verum ad accuratum ac diligentem Materiæ Medicæ tractationem instituentem, remediij cujusque historiam et virtutes à medicis recensitas exponere non sufficit; sed etiam multa insuper consideranda sunt ac perpendenda.”—GEOFFROY, *Tract. de Mat. Med.*

Writers on Materia Medica, ancient as well as modern, have generally concurred in applying the name *Storax* or *Styrax* to two distinct substances namely *Liquid* and *Solid* Storax. I might almost say to two *groups* of substances, since each comprehends two or more varieties.*

The plant to which Storax, at least the solid kind, is commonly referred, is *Styrax officinale* Linn., a small tree of the Nat. Ord. *Styracææ*, occurring in Provence, Italy and the Levant. It is this tree, to which all authors admit, the account of Storax given

* A conventional distinction of confining the name *Storax* to the *solid* drug and *Styrax* to the *liquid*, is adopted by some modern authors. But as such a use of terms leads to some inconsistency, I have not adopted it, but employ the word *Storax* as the English equivalent of the original Greek word Στυράξ.

by Dioscorides in the first century, refers.* In fact, it is not unreasonable to suppose that a tree so nearly allied to that producing Benzoin, should be capable of affording an analogous product.

That it may under certain favorable circumstances exude a fragrant resin, even in France and Italy, we know from the positive testimony of two authors, the first of whom, Duhamel, has written in these words :

“J’ai trouvé en Provence, près de la Chartreuse de Montrieu, sur de gros Aliboufiers, des écoulements assez considérables d’un baume très-odorant. Il n’est pas douteux, ce me semble, que ces Aliboufiers ne fournissent du Storax.”†

The second author is the Abbé Mazeas who, in a communication under date 18 Jan. 1769 addressed to the *Journal des Scavans*,‡ states that on a plain in the neighborhood of Tivoli, near Rome, sheltered on the N. and N.E. by a chain of mountains contiguous to Monte Genarro, Rocco Giovane, S. Polo, &c., which form a semi-circle open to the south,—in fact, in a very warm situation,—the *Styrax* shrub yields by incisions in its bark the valued exudation known as *Styrax en larmes*.

As the account of Storax left us by Dioscorides, who was a native of Cilicia, one of the countries affording the drug, is important, I will here give its literal translation, subjoining in a note the Latin text of Sprengel, the latest commentator upon that author.

[This Latin has been omitted to gain space.—Ed.]

Storax is the exudation of a certain tree resembling a quince tree. It is preferred yellow and shining, resinous, having whitish lumps, retaining

* Perhaps I ought to except Professor Orphanides of Athens, who has hinted that the text of Dioscorides on the subject of Storax, requires correction. *Bulletin de la Société Botanique de France*. T. iij. p. 147.

† *Traité des Arbres*. Paris, 1755. 4to. T. ij. p. 289. Montrieu or Montrieux is a little place about 10 miles to the north of Toulon, in the department of the Var. In this neighborhood, the *Styrax* grows wild.

In order to endeavor to obtain an authentic specimen of the exudation of *Styrax officinale*, I wrote to my friend Dr. Planchon of Montpellier, who at my suggestion kindly caused incisions to be made during the hottest part of last summer, in the trunk and branches of a large and fine *Styrax* growing in the Botanic Garden there. The experiment was quite unsuccessful: neither aqueous sap nor resinous juice flowed from the incisions.

‡ Vol. for 1769, p. 105.

for a long period a very grateful odor; when softened, it emits a certain honey-like humidity. Such is the Gabalite, the Pisidian and the Cilician [Storax.] That of bad quality is black, friable and branny. There is also found an exudation resembling gum, transparent, myrrh-like; but this is produced rarely. Storax is adulterated with the powder of the tree itself, made by the erosion of little worms, honey and the dregs of iris* and some other things, being added. There are those who pound with storax in very hot weather, either wax or tallow imbued with aromatics, and press it through a strainer having wide openings, into cold water, forming as it were, little worms; they sell this, which they call *vermiform Storax*. Inexperienced persons admit it as genuine, not regarding its remarkably powerful odor; for that which is not fraudulent is somewhat strong.

The particulars given by Pliny in this chapter on Storax, are very minute and explicit, although his supposition that the drug packed in reeds was a natural production, and his notion of it being attacked by insects, must be regarded as erroneous.

The following is Pliny's account:

"That part of Syria joining up to Judæa, and lying up to Phœnicia, produces *Storax*, which is found in the vicinity of Gabala and Marathus, as also of Casius, a mountain of Seleucia. The tree bears the same name, and has a strong resemblance to the quince. The tear has a harsh taste, with a pleasant smell; in the interior it has all the appearance of a reed, and is filled with a liquid juice. About the rising of the Dog-star, certain small winged worms hover about this substance and eat it away, for which reason it is often found in a rotten state, with worm-holes full of dust. The Storax next in estimation after that already mentioned, comes from Pisidia, Sidon, Cyprus and Cilicia; that of Crete being considered the very worst of all. That which comes from Mount Amanus, in Syria, is highly esteemed for medicinal purposes, and even more so by the perfumers. From whatever country it comes, that which is of a red color is preferred, and it should be both unctuous as well as viscous to the touch; the worst kind is that which crumbles like bran, and is covered all over with a whitish mould. This substance is adulterated with the resin of cedar or with gum, and sometimes with honey or bitter almonds; all which sophistications may, however, be detected by the taste. The price of storax of the best quality is seventeen denarii per pound.† It comes also from Pamphylia, but this last is more arid and not so full of juice."‡

The localities here mentioned, include those cited by Dios-

* Possibly some residue obtained in making the preparation called *Irimi spissamentum* described lib. I. cap. LXVI.

† Equal to 16s. per lb. avoirdupois.

‡ Pliny's *Natural History*, Bostock and Riley's translation: Book xij. Chap. 55.

corides: and most of them can be identified. Gabala is the modern village of Djebeleh, a few miles to the south of Latakia. The ruins of Marathus still exist. Casius and Amanus are mountains near the Gulf of Iskenderun, still to be traced under Turkish names. The position of the ancient countries of Pisidia, Pamphylia and Cilicia in the south-eastern part of Asia Minor is well known: and Sidon, Cyprus and Crete are familiar to all. In several of these localities, *Styrax officinale* is, at the present day, a common wild shrub.

The drug thus described by these ancient authors, is that which I conceive to be the original and legitimate Storax, namely a fragrant resin in separate, or more or less agglutinated tears, somewhat resembling Benzoin, exuded either spontaneously or after incision, from the trunk of the *Styrax officinale* of Linnæus. That such a drug, in a state of greater or less purity, was in former, and even in comparatively recent times, an article of commerce, appears certain from the specimens still existing in a few old collections of *Materia Medica*, as well as from the descriptions of the best Storax given by the pharmacologists of the last century agreeing very fairly with the account left by Dioscorides.*

This fine kind of Storax, always extremely scarce, was called *amygdaloid*, from the small, white, almond-like tears of which it partially consisted. It also bore the name *Styrax calamites*, a term derived from the ancient method of packing it in reeds (*calami*).† It has, however, wholly disappeared from commerce, its name alone *Styrax calamites* or *calamita* being retained in favor of that odoriferous, sawdust-like compound which we are accustomed to find in the shops. In France, it is applied to a black, extractiform, odoriferous substance which I shall more particularly describe in a future paper.

* See especially Kirsten, *Exercitatio de Styrace*, Altorf, 1736. 4to:

† According to Matthiolus, the allusion to *Calami* in connexion with Storax first occurs in Galen. I find the passage to be as follows:

“Manifestum insuper est Styracem quæ in calamis à Pamphiliâ apportatur, Andromachum præcipere. Paucissimus autem illic styrax nascitur: tantumque ab hoc vulgari distat, quantum à vino quod in tabernis venditur Falernum.” (Galen. *De Antidotis*, lib. i. cap. 14.)

The term *Calamites* has been supposed to be derived for *καταβαλίτης*, a vulgar reading for *καβαλίτης*, as explained at length by Matthiolus (*Comm. in lib. I. Dioscorid.* cap. LXVIII.)

Although we possess no modern account of the collection of solid Storax, confirmatory of that given by Dioscorides, other than those I have quoted (which do not, however, relate to collecting the drug for the purposes of commerce,) there exist two remarkable statements of the method of collecting *Liquid Storax*, which it will not be unprofitable to examine with some attention. I ought, however, first to state that it is questionable whether the Greeks were acquainted with *Liquid Storax*: Arab writers on the other hand, distinctly mention it, though their accounts are far from satisfactory and clear.*

The first of these two statements is that of James Petiver, an apothecary of London, who was noted as the possessor of a considerable collection of objects of natural history.

In the year 1708, that is ten years before his death, Petiver presented to the Royal Society of London a communication which, *verbatim et literatim*, is as follows:

“*The Manner of making Styrax liquida, alias Rosa Mallas.*

Communicated by Mr. James Petiver, F.R.S.

Rosa Mallas grows upon the Island *Cobross*, at the upper end of the *Red Sea* near *Cadess*, which is 5 days' Journey from *Suez*: It is the Bark off a Tree (taken off every Year, and grows again) boiled in Salt Water till it comes to a Consistence like Bird-lime, then separated and put into a Cask and brought to *Judda*, and so to *Mocha* in *June* and *July*, where it sells from 60 to 120 Dollars *per* Barrel, according to its Goodness: the best is what is freest from Clay and Dirt, which is commonly mixed with it; and the way to try it is by washing it in Salt Water which will cleanse it: The *Arabs* and *Turks* call it *Cotter Mija*.

N.B. *A Barrel is 4201.*”†

A statement so precise and circumstantial was received with more or less credit, and we find it quoted by Geoffroy,‡ Hill,§ Alston,|| Mérat and DeLens,¶ Martiny,** Guibourt,†† Pereira,‡‡ Royle,§§ &c.

* *Avicennæ Liber Canonis*, lib. II. tract. 2. cap. 431. 600. 622. (ed. Venet. 1564.)

† *Philosophical Transactions*, 1708–1609. Vol. xxvi. p. 44.

‡ *Tract. de Mat. Med.* (1741,) T. II. p. 493.

§ *History of the Materia Medica* (1751,) p. 713.

|| *Lectures on the Materia Medica* (1770,) Vol. II. p. 418.

¶ *Dictionnaire de Matière Médicale*, T. IV. (1832,) p. 128

** *Encyklop. d. med.-pharm. Nat. u. Rohwaarenk.* Bd. I. (1843) p. 94.

†† *Histoire des Drogues Simples*. T. II. (1849,) p. 294.

‡‡ *Elem. of Mat. Med.* Vol. II. (1850,) p. 1216.

§ *Manual of Mat. Med.* (1853) p. 639.

Hill, indeed, quaintly remarks, "it is a little unlucky that nobody has given us any description of this *Rosa Mallas*."—But is *this* the only ambiguity? Let us first ask,—*Does there exist any island of Cobross at the upper end of the Red Sea?*

Thanks to the excellent chart of the Red Sea made from the surveys of Messrs. Moeresby and Carless in 1830–33, and to the minute *Sailing Directions for the Red Sea*, both published by the Hon. East India Company, we have a mass of very exact and positive information relating to its coasts, and to its islands from the largest down to the very rocks and shoals. Now Petiver makes his island of *Cobross* to be "*near Cadess which is 3 days journey from Suez*." To what distance we ought to consider this to be equivalent, I know not; but it is evident from the chart already referred to, that there is no island in the Red Sea nearer to Suez than about 160 miles. Neither this island, nor any other in the Red Sea, bears the name of *Cobross*, or any other name which can be supposed to represent it,—that is, so far as my researches have gone, and I have taken much pains in investigating subject.

Again,—are there any islands in the Red Sea extensively wooded, as Petiver's account would lead us to suppose? On this point, the minute information in the *Sailing Directions*, is entirely of a negative character.

Distrusting my own judgment in such a question, I applied to John Walker, Esq., Geographer to the Hon. East India Company, and to the Rev. Charles Forster, author of the *Historical Geography of Arabia*, gentlemen whose acquaintance with sources of information on such matters, might, I thought, suggest some explanation of Petiver's statement: but neither of them has been able to throw any light upon it.

Although I am unable to find a *Cobross* in the Red Sea, I must state that D'Herbelot in his *Bibliothèque Orientale* gives *Cobros*, as a synonym of *Cyprus*: and also, that Pliny mentions an island of *Coboris* or *Covoris*, which has been identified as one of the Sohar Isles, near Burka, a town situated on the East coast of Arabia, near the entrance to the Persian Gulf.* The position of either of these islands is, of course, perfectly irreconcilable with that of Petiver's *Cobross*.

* Forster's *Historical Geography of Arabia*, Lond. 1844. Vol. ij. p. 230.

It is somewhat surprising that of the many authors that have quoted Petiver's account of *Liquid Storax*, none appears to have been struck with the fact that the drug is not said to be conveyed from "Cobross" to Europe, but that it is "*brought to Judda, and so to Mocha*,"—that is to say, it is carried to a spot some 1300 miles south of Suez.

So much for the fallacies in Petiver's account of "The manner of making *Styrax Liquida*." In a future part of this notice, I will endeavor to show what traces of truth it contains.

The next statement on which I propose to offer some remarks, is that of Dr. X. Landerer of Athens, as contained in a communication published in Buchner's *Repertorium* for 1839.†

This communication, I translate thus :

The Storax plant, *Styrax officinalis*, is found in various parts of continental Greece, as well as in some of the islands of the Archipelago. There, however, it forms but a small shrub and does not possess the agreeable odor ascribed to it by botanists. The bark of the plant occurring in Greece, has not the slightest odor, which probably is due to neglect in cultivation. On the contrary, such is not the case with the plant as found in the Turkish islands of Rhodes and Cos, and especially with it as cultivated by the people of Cos. (a)

As I obtained some time since in Syra from a merchant coming from Rhodes some information on the subject, I will make it public, not doubting that, though but little, it will be acceptable.

The Storax plant is called in Cos and Rhodes *βουχούρι* (*buchûri*.) At its flowering season, it fills the air with the most agreeable vanilla-like perfume. At the period for the collection of the bark and younger twigs, which are employed for the preparation of *Buchuri-jag*, i. e. *Styrax-oil* (oil being called in Turkish, *jag*), permission is obtained from the Pasha residing at Rhodes, a small sum being paid for it. Those who are provided with the permission to collect, now make with small knives longitudinal incisions and peel off from the stem the fresh pieces of bark in the form of little narrow ribbons. Owing to their adhesive juice they easily stick together [*backen sie leicht zusammen* ;] from them are formed masses of one oke weight (=2lbs.), which are reserved for the preparation of *jag*, or are immediately purchased by Rhodian merchants and sent to Rhodes.

The preparation of *Buchuri-jag* is effected by merely pressing the before-mentioned masses in presses somewhat warmed, called *Styrakia*, and not by boiling. The *jag* obtained by gentle pressure is of an unctuous consis-

† *Einige Worte über die Gewinnung des Storax liquidus* vom Prof. und Leibapotheker X. Landerer in Athens, *Buchner's Rep. für d. Pharm.* Bd. 18. s. 359-362.

tence, a light grey color, and diffuses a very agreeable vanilla-like odor. This is the only sort that is exported; but in Cos and Rhodes, it is also used in the preparation of a very odoriferous mass made by the addition of finely-powdered Olibanum, and formed into cakes of the size of a fist, which are called *Styrakia*. The preparation of these masses belongs exclusively to the conventual clergy, who distinguish their manufacture with the convent seal.

By repeated warming and stronger pressure, an almost black *Buchurijag* is obtained, which is used by the inhabitants themselves for the most healing ointments and medicines.

The bark remaining after the expression of the *jag* is bound together and conveyed partly to Constantinople and partly to Syra and there used for fumigation.

With regard to the decoction of the bark and the adulteration of *Styrax*-balsam with turpentine, the Rhodian merchant assured me that they would not know how to go about it; and that the adulteration with turpentine, might, in case of detection, involve even the punishment of death.

[Note a.] The *Storax* trees appear at that place to be of important value, and are given to the young women as dowry, in the same manner as in Greece; the bride is presented with so many Olive-trees.

That Dr. Landerer has been greatly deceived by his informant will, I think, be very evident from the subjoined testimonies:

1. Niven Ker, Esq., who was for several years British Consul at Rhodes, informed me that he was quite ignorant of the carrying on in that island of the manufacture described by Dr. Landerer.

2. Sidney H. Maltass, Esq. of Smyrna, in a letter to me under date 7 October, 1853, speaking of *Liquid Storax*, says, "Cos and Rhodes produce none."

3. Lieutenant Robert Campbell R. N., H. B. M. Consul at Rhodes, writes from Rhodes under date 16 December, 1855, that Mr. Landerer in attributing to the Islands Cos and Rhodes the production of *Storax*, has committed an egregious error, as they have never produced it.

Moreover, the evidence of Mr. Maltass proves, as I shall shortly show, that *Styrax officinale* is not the tree yielding *Liquid Storax*.

There are other exceptional points in Dr. Landerer's account, which I will for the present pass over, remarking only that the statement that liability to the punishment of death is incurred in the case of a person being detected adulterating *Storax* with

turpentine, is characterized by Lieut Campbell as "a mere invention."

Previous to detailing the information which I have collected as to the method of preparing *Liquid Storax*, it will be well briefly to review the various opinions which have been held as to its origin.

1. Many of the older writers on *Materia Medica* consider it an artificial compound; Dale, in particular, asserts, that what was found in the London shops in his time (1698) was altogether factitious.

2. Those writers who adopt Dr. Landerer's statement, regard *Liquid Storax* as the produce of *Styrax officinale* Linn.

3. By many authors, *Liquid Storax* is referred to *Liquidambar styraciflua* Linn., a tree found in the southern part of the United States, in Mexico, and in other parts of Central America.

However capable that tree may be of producing an analogous resin, it is well ascertained that the *Liquid Storax* used in England, is all imported from the Levant; and there are sufficient reasons to conclude that such is also the case with that used on the continent and that it is certainly not the produce of America. I therefore dismiss the supposition that the *Liquid Storax* of commerce is of transatlantic origin.

4. By some authors, *Liquid Storax* has been conjectured to be the produce of *Liquidambar altingiana* Blume.

This tree is a native of the islands of the Indian Archipelago and of Burmah, where the inhabitants occasionally extract from it an odoriferous semi-fluid resin; but the product is not abundant, nor does it resemble the *Liquid Storax* of commerce; there is not, moreover, the slightest evidence of it reaching Europe in any quantity.

It is, however, a curious fact that the name by which this tree is at the present day known to the Malays, is *Rasamala*, a word very close to Petiver's *Rosa Mallas*. To this I shall revert in a future page.

5. *Liquidambar orientale* Miller, is regarded by Guibourt, Lindley, the authors of the French *Codex*, and some others, as the source of *Liquid Storax*, an opinion which I shall be able to show to be correct.

Having brought under review the various opinions current as

to the origin of *Liquid Storax*, and stated the points on which I consider them erroneous, I will now proceed to communicate the information which I have myself received regarding the drug from three valued correspondents in the Levant, namely, Sidney H. Maltass, Esq., of Smyrna, Lieut. Robert Campbell, R.N., H.B. M. Consul in the Island of Rhodes, and Dr. James McGrath of Smyrna.

The information is still not quite perfect, but in all essential particulars I believe the following is a correct account of the

Preparation of Liquid Storax.

BOTANICAL ORIGIN.—The tree from which Liquid Storax is obtained, is *Liquidambar orientale* Miller (*L. imberbe* Aiton), as is proved by specimens of the leaves and fruits procured at my request by Mr. Maltass (see wood-cut).

LOCALITIES.—South-west of Asia Minor.—Forests in the district of Sighala, near Melasso; forests near Moughla, and near Giova and Ullà, in the Gulf of Giova; also near Marmorizza and Isgengak, opposite Rhodes.

Mr. Maltass passed through a dense forest of *Liquidambar* between the village of Caponisi and the town of Moughla on the 7th or 8th of May, 1851: he describes it as consisting of trees resembling the plane, but evidently of a different species, the leaf being smaller, and each tree far denser in foliage than the plane usually is. "I also observed," says he, "that most of the larger trees had the [outer] bark stripped off from the trunk and the inner bark scraped off. I gathered some of the fruit and leaves, and proceeded on my journey towards Moughla, my road lying for upwards of an hour through this beautiful forest. I observed that the trees were from twenty to thirty feet in height, but whenever there was a break in the forest and the trees had sufficient air and space, they were of larger growth, many of them being forty feet high, more especially in the immediate vicinity of streams of water. My guide assured me that in some places in the forest in the direction, of Melasso, he had seen some of these trees sixty feet in height. He could not tell me the name of the tree, but stated that an oil was produced from it called *Buchur*, and that the trees were mutilated to obtain it."

EXTRACTION OF THE LIQUID STORAX.—In June and July, the outer bark is stripped off on one side of the tree and (according



LIQUIDAMBAR ORIENTALE MILL.

From a specimen obtained by S. H. Maltass, Esq., from the coast of Asia Minor opposite Rhodes.
Fitch, *del.*

to Lieut. Campbell) made into bundles and reserved for the purpose of fumigation. The inner bark is then scraped off with a semi-circular or sickle-shaped knife and thrown into pits until a sufficient quantity has been collected. Mr. Maltass states that it is then packed into strong horse-hair bags and subjected to pressure in a wooden lever press. Upon removal from the press, hot water is thrown over the bags and they are pressed a second time, after which the greater portion of the resin will have been extracted.

Lieut. Campbell's account is a little different : he says the inner bark is boiled in water over a brisk fire, upon which the resinous part comes to the surface and is skimmed off. The boiled bark is next put into hair sacks and pressed, boiling water being added to assist in the extraction of the resin, or, as it is termed, *yagh* (i. e. *oil*.)

Dr. McGrath says that the Storax collectors, who are chiefly a tribe of wandering Turcomans called *Yuruks*, are armed with a triangular iron scraper with which they scrape off, together with the juice of the tree, a certain quantity of bark, which they collect in leathern pouches suspended to their belts. When a sufficient quantity has been obtained, it is boiled in a large copper and the separate liquid resin is run into barrels. The residual bark is placed in hair-cloth and and pressed in a rude press, the extracted resin being added to the general mass.

The product obtained by the processes here described, is the grey, opaque, semi-fluid resin, well known as *Liquid Storax*.

The bark from which the *Liquid Storax* has been extracted, is emptied out of the bags and exposed in the sun to dry, after which it is shipped to the Greek and Turkish islands and to many towns in Turkey, where it is much esteemed for the purpose of fumigation, although since the disappearance of the plague, its employment has greatly diminished.

This is the substance known to pharmacologists as *Cortex Thymiamatis* or *Storax Bark*, as is proved by abundant specimens sent me by Mr. Maltass.

ADULTERATION.—Mr. Maltass says that Liquid Storax is rarely pure, being adulterated by the admixture of sand and ashes.

COMMERCE.—Lieut. Campbell states that the quantity of

Liquid Storax annually extracted amounts to about 20,000 *okes* (500 cwt.) from the districts of Giova and Ullà; and 13,000 *okes* (325 cwt.) from those of Marmorizza and Isgengak.

It is exported in casks to Constantinople, Smyrna, Syra and Alexandria. Some is also packed with a certain proportion of water in goat-skins and sent, either by boats or overland, to Smyrna, where it is transferred to casks and shipped mostly to Trieste.

It appears from Mr. Maltass, that formerly the whole, both of the resin and the residual bark, was bought by the merchants of the island of Rhodes, but at what period and under what circumstances this occurred, I have not been able to learn.

[NOTE.—We omit that portion of this paper, which has reference to the derivation of oriental names used in connection with the subject, for want of space.—EDITOR AM. JOUR. PHARM.]

The conclusions to which this long investigation leads, may be thus briefly summed up.

1. That the original and classical Storax was produced by *Styrax officinale* Linn.
2. That always scarce and valuable, it has in modern times wholly disappeared from commerce.
3. That the account of the collection of *Liquid Storax* given by Petiver and Landerer are in many important particulars grossly erroneous.
4. That *Liquid Storax* is the produce of *Liquidambar orientale* Miller, and that it is collected in the south-west of Asia Minor.
5. That the bark of *Liquidambar orientale* Miller, after *Liquid Storax* has been expressed from it, constitutes the *Cortex Thymiamatis* of Europe.
6. That there is no evidence of the *Νάσκαφθεν* of Dioscorides being the bark of *Liquidambar orientale*.—*London Pharm. Jour., Feb. and March, 1857.*

[NOTE.—The satisfactory determination of *Liquidambar orientale* as the source of commercial Liquid Storax leads us to say a few words in reference to the *Liquidambar styraciflua* of this country. The tree grows abundantly in New Jersey near this city and attains a height of fifty feet. In this latitude the tree does not give a resinous exudation, but in Kentucky and further South a soft resin exudes by wounding the bark which possesses a benzoic odor and taste, and is used in the Western States for chewing,

as a masticatory, to sweeten the breath. We have in our possession a specimen of the resin of Liquidambar presented by Mr. Wayne of Cincinnati. It consists of conglomerated tears, varying in color from light yellow to black, and softens when chewed, like tolu. When boiled with milk of lime, the filtered decoction has a light yellow color, and yields a crystalline precipitate on adding muriatic acid, like benzoïn. These crystals, in hot water, saturate ammonia, and the neutral ammoniacal solution precipitates sesquichloride of iron in red flocks. They are probably benzoic acid. The figure in the margin gives an idea of this plant, and of its close analogy to the oriental species in the shape of its leaf and fruit vessels.]



A METHOD OF IMPARTING A RED COLOR TO BONE AND IVORY.

By DR. J. C. KELLERMANN.

The bone to be colored is laid for fifteen to twenty minutes in very dilute cold nitric acid of the strength of a good vinegar; this dilute nitric acid is obtained by mixing fully $\frac{1}{2}$ a litre of soft water with about 13 grms. of nitric acid. The bone is then immersed for fifteen to twenty minutes in a solution of protochloride of tin, made by dissolving a piece of the size of a lentil in a pint of water. The objects thus mordanted are then put into the following red-bath, which must first be heated until it begins to boil.

Red-bath.—For an experiment on the small scale, take 3 to 5 grs. of fine red carmine, pour to it 10 to 12 drops of ammonia, and stir it up well until the carmine is dissolved; then add about 2 oz. of soft water. In this bath, when heated to boiling, the objects must be left for about fifteen minutes. The tints obtained are more vivid when the boiling of the bath is not continued whilst the objects are in it.

If it be desired to change the tint thus obtained (a very fiery carmine-red) to a more scarlet color, one of the following methods may be employed. When the red-bath begins to boil, and immediately after the objects have been immersed in it, 5 to 10 drops of tartaric acid of the strength of a good vinegar may be added; or the water in which the protochloride of tin is to be dissolved may be mixed with an extremely small quantity of English sulphuric acid.—*Chem. Gaz., from Dingler's Polytechn. Journal.*

ON PEPSINE.

By W. STEVENS SQUIRE, Ph. D.

Some time since a new medicine, under the name of pepsine, was introduced in Paris, and was extensively used there by Dr. Corvisart and others, apparently with considerable success in dyspepsia and certain cases of consumption. This preparation consists principally of a substance well known to Chemists and Physiologists, the nature and composition of which, however, is but imperfectly made out. It is, in fact, to a principle termed pepsine that the gastric juice chiefly owes its property of converting meat and other matters received into the stomach, into a form in which they can be readily assimilated.

By the term gastric juice is understood a fluid secreted by the stomach, and poured into it through a number of minute tubes, situated in the mucous membrane which forms the interior coat. These tubes are, during fasting, plugged up by a mass of epithelial cells; but when the mucous membrane is irritated by food or by certain other stimulants—pepper, for example—the secretion of gastric juice commences, the plugs of epithelium are expelled, and the juice distils into the cavity of the stomach.

Gastric juice contains about 97 per cent. water, 1.25 per cent. pepsine, and 1.75 per cent. salts, consisting of carbonate and phosphate of lime, chloride of sodium, minute traces of sulphates, and sometimes a trace of ammoniacal salts. The proportions, however, in which these inorganic constituents are present, vary considerably. Lastly, the gastric juice contains a free acid, which is one of the most important components.

As it would be impossible to obtain a sufficient quantity of gastric juice for medicinal purposes from living animals, either by fistulous openings or any other method, we seek to intercept the pepsine before it passes into the stomach, and to extract it from the little tubes in which it is secreted, or at all events along which it passes on its way. For this purpose the rennet-bags of sheep are the most convenient, on account of the large supply which is always at hand; and the following process has been proposed by M. Boudault:—The rennet-bags are opened and reversed, and washed under a thin stream of water, to free them from alimentary matters, &c. The mucous membrane is then

carefully scraped off with a knife, the cells are bruised in a mortar, and digested for twelve hours in distilled water. The liquid is then filtered, and neutral acetate of lead is added, which precipitates peptate of lead. This precipitate is collected and decomposed by means of sulphuretted hydrogen, pepsine is thus liberated in solution, and is separated from the insoluble sulphide of lead by filtration. This liquid represents a neutral gastric juice. It is, however, necessary that it should be acid, and for this purpose lactic acid is added until the liquid exhibits the same degree of acidity as a specimen of gastric juice, obtained from the stomach of a dog by means of a fistulous opening. The reason why lactic acid is selected for this purpose will be shown below. If the artificial gastric juice thus obtained, be evaporated to dryness at a gentle temperature (it should not exceed 100° Fah.), a gummy mass is obtained, which attracts moisture from the air, and is altogether a very unfit article either for sale or administration. In order to reduce it to powder, M. Boudault simply evaporates his artificial gastric juice to a syrupy consistence, and to this he adds dried starch in such proportion that one gramme (15 grains) shall be in a position to digest four grammes of dry fibrine, when the two are submitted together in the presence of water to the temperature of the human body.

The substance thus produced is a fawn-colored powder, cohering somewhat together, and possessing a peculiar taste and odor. It yields to water the lactic acid and the pepsine, producing a solution of a yellowish tint, with the color, odor, and taste of gastric juice.

A solution of pepsine—that is to say, the neutral artificial gastric juice—presents the following reactions:—Salts of lead and mercury give rise to precipitates, which, when decomposed by sulphuretted hydrogen, reproduce the pepsine with its physiological properties. Tannin likewise precipitates pepsine, but the precipitate has no power whatever of digesting fibrine. Rectified spirit precipitates the pepsine from its solution. This precipitate is soluble in water. Absolute alcohol dehydrates pepsine, and destroys, or at all events greatly diminishes its digestive power. One property, however, which pepsine possesses, which is very characteristic, and which is a fruitful source of failure in its preparation, is, that at the temperature of about 120° Fah.,

its solution becomes slightly turbid, and loses entirely its digestive properties.

There has been considerable difference of opinion with regard to the nature of the acid in the natural gastric juice; some Chemists assert, that the acidity is mainly due to hydrochloric acid, some are advocates for phosphoric acid, others again for lactic acid, but it is universally admitted that the gastric juice must be acid, to produce its physiological effects, and that lactic acid is always present to a greater or less extent. Lehmann found, that when gastric juice is distilled, the first portions which passed over were free from hydrochloric acid, but as the liquid became more concentrated, hydrochloric acid was obtained; and this he ascribed to the property possessed by concentrated lactic acid of decomposing the compounds of the strongest acids, and in this case to the decomposition of the chloride of sodium.

In order to determine this question, M. Boudault made the following experiments. He first wished to ascertain whether the gastric juice, as it issued from the mucous membrane, was acid or not. With this view, the rennet-bags were carefully cleaned and washed as long as any acid reaction was manifested to litmus paper; the cells were then bruised, and treated with cold distilled water; and in this way a perfectly neutral fluid was obtained. This fluid did *not* possess the power of digesting fibrine at the temperature of the body, but on the addition of a little lactic acid a complete digestion was obtained.

Now it is well known that pepsine has the property of converting glucose or grape sugar into lactic acid, and when we consider that the saliva can by its action convert amylaceous substances into glucose, and that pepsine determines the conversion of glucose into lactic acid, we have a very fair explanation of the acidity of the fluid found in the stomach.

Boudault found that a mixture of glucose, neutral pepsine, and fibrine, yielded complete digestion after twelve hours. The process of digestion did not, however, commence until the liquid had assumed a strongly acid reaction. I will not, however, say that lactic acid is the only acid which is capable of playing this part; on the contrary, hydrochloric and acetic acids yield perfect digestions, but not with the same rapidity as lactic acid.

From a number of digestive experiments carefully performed,

Boudault found that the pepsine obtained from herbivorous animals is identical in its properties with that obtained from the carnivora, and may be substituted for it, so far at least as the digestive functions are concerned.

The employment of an artificial digestive agent is not new in medicine. The liquid obtained by treating rennet with water, acidified with some acid, has been given with success, but it has never been much used—probably in consequence of the disagreeable nature of the dose; but now that we have the means placed before us in an elegant form, it is no longer a matter of difficulty. The details and the cases where it may be employed will suggest themselves to every medical man. There are at present four preparations of pepsine in use—namely, No. 1, acidified with lactic acid; No. 2, which contains in addition 1 per cent. hydrochlorate of morphia; No. 3, containing $\frac{1}{4}$ per cent. strychnia; and No. 4, which contains no lactic acid, and is useful where there is an excess of acidity.

Other medicines, however, may be given in conjunction with pepsine, without in any way impairing its action; among these are subnitrate of bismuth, lactate of iron, carbonate of iron, iodide of iron, and reduced iron. Attempts have likewise been made to form a syrup of pepsine, as a more agreeable way of exhibiting this medicine; but it was found that the sugar was after some ten or twelve days converted into glucose, and finally into lactic acid. A solution of pepsine will keep any length of time, provided air be excluded; but, in the presence of air, decomposition soon sets in: and I have found that the best form to keep it in is that of a powder, as originally proposed by M. Boudault. It may be taken in this form very conveniently between two slices of bread, or in the first spoonful of soup, which, however, should not exceed the temperature of the body, the dose being about fifteen grains.

The gastric juice possesses all the characters of a diluted acid; it attacks iron filings, and decomposes the alkaline carbonates, and it appears to me that this fact would justify a much more extended use of the lactates than at present prevails, for such preparations as *ferrum radactum*, *ferri carbonas saccharatum*, *mistura ferri*, &c., must be resolved into lactates soon after they reach the stomach, and that, too, at the expense of one of the most important constituents of the gastric juice.

[Mr. Squire has notified, in letters to the *Lancet* and *Medical Gazette*, the existence of a spurious preparation of Pepsine, for distinguishing which he gives the following tests:—

True Pepsine.	Test.	False Pepsine.
Abundant precipitate (Peptate of Lead) }	.....Acetate of Lead.....	Slight cloudiness.
Abundant precipitate (Tannate of Pepsine) }	.....Tannin.....	Ditto.
Precipitates the Pepsine }	.....Alcohol.....	No effect.

The solution of true Pepsine is strongly acid to litmus, whilst the false is only so in a slight degree; but, more than all, M. Boudault's preparation does what it professes to do: fifteen grains digests its drachm of dried fibrin, while the spurious compound is entirely destitute of this property.—*Lancet*.

The most serious contamination of Pepsine is that contained in No. 3, namely, strychnia! For what purpose this is introduced we cannot imagine; but the circumstance of keeping such company is likely to cause alarm, and thus to create a prejudice unfavorable to the general introduction of Pepsine into dyspeptic society.—ED. PHARM. JOURN.].—*Lon. Pharm. Jour.*, March 2, 1857.

ON THE DETECTION OF STRYCHNINE IN CASES OF POISONING.

By DR. J. E. DE VRY, Lecturer on Chemistry; and E. A. VAN DER BURG, Pharmaceutical Chemist of the Rotterdam Hospital.

In the month of September, 1856, we were required by the *Juge d'Instruction* to make a chemical investigation of the contents of the body of a man, on the cause of whose death there was some suspicion of poisoning. The man having been brought to the hospital in a tetanic state, we were naturally induced to try to find strychnine in the contents of the body; but neither this nor any other poison was to be found, so that the death of this man remained unexplained.

The discordant opinions of several chemists in the famous trial of Palmer, made it necessary, for our own persuasion of the truth, to institute a series of experiments, to make out:—1st. The sensibility of the principal reagents on strychnine; 2nd. The possibility of detecting strychnine with these reagents, if the strychnine is mixed with animal substances; 3rd. If strychnine

nine can *always* be found in the corpse of an individual poisoned by it.

1st. Sensibility of the principal reagents on strychnine: *Chromate of potash or ferridcyanide of potassium and concentrated sulphuric acid.*—By these reagents $\frac{1}{60000}$ of a grain of strychnine can be detected, if one drop of a solution, containing one grain of strychnine in 60,000 grains of water, is evaporated in a small porcelain dish on a water-bath, and the remaining substance moistened with the smallest possible quantity of pure concentrated sulphuric acid. By introducing in this solution a *very small* fragment of a crystal of bichromate of potash or ferridcyanide of potassium, and moving this fragment with a glass rod in the solution, a beautiful dark purple color is produced on every part of the surface of the porcelain that has been in contact with the acid solution, and the fragment of one of the two salts.

Bin-iodide of potassium, and iodide of mercury and potassium.—By a solution of one of these compounds, $\frac{1}{50000}$ of a grain of strychnine can be detected. These reagents, like the following, possess only the ascertained sensibility, provided the drop of liquid is contained in a capillary test-tube, in which the liquid, although only a drop, forms a small column, in which the formation of a precipitate can be observed by comparison with a similar capillary tube filled with pure water, and mixed with the reagent.

Tannic acid reveals $\frac{1}{25000}$ of a grain of strychnine.

Solution of chlorine in water, $\frac{1}{3000}$.

Sulphocyanide of potassium, $\frac{1}{3000}$.

Neutral chromate of potash, $\frac{1}{3600}$.

The precipitate formed by bin-iodide of potassium is brownish-red, and if dissolved in weak warm spirit, acidulated by sulphuric acid, beautiful crystals are formed of sulphate of iodo-strychnine, which polarize the light, as has been discovered by Mr. Herapath. The precipitate formed by iodide of mercury and potassium, by tannic acid, and by solution of chlorine in water, are white. This last reagent must be used in relative large quantity, and the precipitate formed by it does not appear immediately.

The precipitates formed by sulphocyanide of potassium and neutral chromate of potash are both crystalline. The color of the former is white, and the form of the crystals observed by the

microscope is very characteristic. The color of the latter is a beautiful yellow. The formation of both these precipitates is accelerated by rubbing the surface of the tube with a glass rod.

The precipitate formed by chromate of potash gets immediately a dark purple color, if moistened by concentrated sulphuric acid. *All* the other precipitates get the same color if they are dissolved in a small quantity of strong sulphuric acid, and the solution brought into contact with a fragment of a crystal of chromate of potash or ferridcyanide of potassium.

2nd. The possibility of detecting strychnine, if mixed or combined with animal substances.

In all the following experiments, the method of Professor Stas was used. This method, by which all organic basic poisons can be detected, consists in treating the animal substance, which is supposed to contain a poison, with spirit of wine, acidulated by pure oxalic or tartaric acid. The tincture, after having been filtered, is evaporated at a gentle heat on a water-bath, and the remaining substance dissolved in anhydrous alcohol. This solution is filtered, and again evaporated, and the remaining substance dissolved in water. The watery solution, after having been filtered and partly evaporated, is saturated with bicarbonate of soda, and afterwards repeatedly agitated with ether, which is made alkaline by a small quantity of caustic potash or soda. If there is any basic organic poison present in the animal substance under examination, it will be obtained by evaporating the ethereal solution, and may be afterwards tested by several reagents to find out its nature.

1st Experiment.—A solution of $\frac{1}{4}$ of a grain of strychnine mixed with 6 ounces of fresh meat. The poisoned meat, treated as mentioned, afforded small crystals of strychnine, of which the identity was proved by the reagents mentioned.

2nd Experiment.—The white and yellow of one egg were mixed with $\frac{1}{4}$ of a grain of strychnine, and this mixture coagulated by the heat of boiling water. The coagulum being treated according to Stas's method, *almost the whole quantity* of the strychnine was recovered in white crystals.

3rd Experiment.—The urine of 24 hours from a patient in the hospital, to whom the physician administered every day $\frac{1}{2}$ grain of nitrate of strychnine, was divided into two equal parts, and

one of these parts mixed with $\frac{1}{4}$ grain of nitrate of strychnine. The two parts treated in the same way as described by Messrs. Graham and Hofmann,* by digesting and agitating during 24 hours with animal charcoal, &c., that part in which $\frac{1}{4}$ grain of the strychnine-salt was dissolved, afforded us crystals of strychnine, *whilst we could not find the least trace in the other part.*

4th Experiment.—On the 15th of September, $\frac{1}{2}$ grain of strychnine was administered to a young dog. Twenty minutes after the introduction of the poison, its action commenced by vehement tetanic spasms, salivation, and excretion of urine, and ten minutes later the dog was dead.† The stomach, liver, gall, bladder, spleen, kidneys, intestines, and blood were taken from the body and separately examined on the 18th September, when they all were in full putrefaction. The result of this investigation was, that a comparatively large quantity of strychnine was obtained from the stomach, whilst *no one of the other entrails* contained the least trace of this poison.

3rd. Can strychnine *always* be found in the corpse of an individual poisoned by it?

After we had proved that the least trace of strychnine could be detected if it was really present, we desired to get the conviction if poisoning by strychnine could *always* be proved by the aid of chemistry. The following experiments were executed with a view of determining this point:—

1st Experiment.—A middle-sized dog was poisoned by introducing a solution of nitrate of strychnine in a superficial wound. Immediately after death, 4 ounces of the blood were treated according to Stas's method, but not the least trace of strychnine could be detected.

2nd Experiment.—On the 26th September we administered to a small dog weighing about 8 pounds, at 10 o'clock in the

* *Annalen der Chemie und Pharmacie*, Bd. 83, S. 39.

† The same dose of poison, mixed with half an ounce of animal fat, was administered to another dog of somewhat larger size, for the purpose of testing the assertion of Dr. Pindell, published some time ago in the *American Journal of Pharmacy*, that fat would neutralize the tonic effect of strychnine. The result, however, proved fatal to the animal, which died an hour and a quarter after the ingestion of the poison.

In this experiment, the admixture of fat to the poison had no other effect than to *retard* (and not to neutralize) its mortal effect.

morning, $\frac{1}{30}$ grain of strychnine mixed with $\frac{1}{15}$ grain of tartrate of antimony and potash. This dose was repeated twice on the following day, at 9 o'clock in the morning, and at 4 o'clock in the afternoon, without any symptom. On the following day the dose was repeated at 9 o'clock, and again at 12 o'clock in the morning, and at 1 o'clock the dog had a violent attack of tetanus, accompanied by salivation and ejection of urine. This attack lasted some minutes, and was soon followed by a second, which was still more violent. At 3 o'clock the dog got a third, and at 8 o'clock a fourth dose of poison, each of which was followed by an attack of tetanus, one hour after the introduction of the poison. On the 30th of September, the situation of the dog was much better compared with that of the preceding evening. At 10, and again at 12 o'clock, a dose of poison was administered, which doses were followed now and then by spasmodic contractions, whilst it appeared that the irritability of the nerves was much increased, for the dog jumped up or trembled at the least noise. At 2 o'clock in the afternoon a third dose of poison was given, which was followed at half-past 2 and half-past 3 o'clock by attacks of tetanus, the latter lasting ten minutes. The fourth dose was given at half-past 5 o'clock. One hour later the dog got the most vehement attack of tetanus, accompanied by salivation and ejection of urine and fœces, which lasted a quarter of an hour, and terminated by the death of the animal. This death was caused by a chronic poisoning, begun on the 26th of September, and terminated on the 30th of September, in which lapse of time the dog got no more than $\frac{14}{30}$ ths of a grain of strychnine, and $\frac{28}{30}$ ths of a grain of tartrate of antimony and potash, which small dose of poison caused seven attacks of tetanus. After each attack, the widely-extended hind feet were much stiffer than the fore feet.

The *post-mortem* examination of the body, which was very carefully performed by the distinguished Assistant-Physician of the Rotterdam Hospital, Dr. Schmidt, proved that there was nothing abnormal to be found which could even lead to the suspicion that death had been caused by the administration of a poison. The chemical analysis of all the parts of the body led to the same negative conclusion, for not the least trace of strychnine could be detected, notwithstanding the great sensibility of our reagents which was proved in the former experiments.

From the alleged facts we may be justified in making the following

CONCLUSIONS.

1. That the method which we pursued for detecting strychnine was adapted to discover the least trace of the poison, for even only $\frac{1}{60000}$ of a grain could be detected.

2. That even when the strychnine is combined with albuminous matter, nevertheless, the *whole* quantity can be separated by the method of Stas, if properly conducted.

3. That if death has been caused by strychnine, this poison can be detected in the body, provided it has been administered in a quantity *more than sufficient* to cause death.

4. That if the poisoning by strychnine has been chronic, and has resulted from a quantity not greater than just necessary to cause death, the cause of this death *cannot be proved*, either by the *post-mortem* examination of the body, or by a chemical investigation of the intestines.

5. That it appears to be highly probable that that part of the strychnine which acts mortally is decomposed in the living body.

6. That the urine of patients who take strychnine or its salts as a medicine, contains not a trace of this poison.

*Rotterdam, 8th Jan. 1857.*¹

Mr. Redwood said that the results described in this paper differed from those which had been obtained by other Chemists under similar circumstances. Several Chemists had detected strychnine in the urine after its administration by the stomach.

Mr. Rodgers (Lecturer on Chemistry at St. George's School of Medicine) observed, that he had paid especial attention to the subject of the detection of poisons, and particularly of strychnine, and that the results and conclusions of the authors of the paper just read, were at total variance with his own and that of Mr. Girdwood, with whom he had made an extensive series of experiments, the results of which and the processes adopted, had already been made public. He did not consider that the process adopted by the authors was of sufficient delicacy to extract strychnine from the blood and tissues of the body, a view that was confirmed by the fact that they had failed to obtain evidence of the strychnine in their experiments, where half a grain of

strychnine was administered to a young dog, in any other analysis beyond the contents of the stomach, and had utterly failed to obtain any indication of its presence in the urine of patients taking strychnine, while Drs. Wrightson, Letheby, Ogle and Mr. Herapath, as well as himself and Mr. Girdwood, had never experienced the slightest difficulty in separating strychnine from all parts of fluids of the body subjected to analysis.

He further observed, that he did not consider the manner of their applying the test of sufficient delicacy to detect the minute quantities of strychnine that could be obtained from the tissues and fluids of the body, it being frequently necessary in such cases to apply sulphuric acid containing a minute quantity of chromic acid, by means of a glass pen, to obtain the distinctive color; the conclusions derived from his own researches were, that strychnine is not decomposed in the body, and can always be discovered if a proper method of analysis is employed. Should any Member of the Society wish to repeat the author's experiments, he would be happy to show him the methods of analysis adopted by himself and Mr. Girdwood, and was perfectly certain that strychnine would be readily found.

Mr. Bastick thought that Dr. De Vry's question had not been answered by the two last speakers, namely, can strychnine be detected in the urine of a patient who does not die from its effects?

Mr. Rodgers said he had detected it in such cases.

Mr. Redwood thought it of the highest importance, if Dr. De Vry's conclusions were erroneous, that they should be corrected as early as possible. He concurred with Mr. Rodgers in thinking that the method described in Dr. De Vry's paper for applying the test for strychnine was not the most delicate method. He had found a solution consisting of one grain of chromic acid in 500 grains of oil of vitriol, the best form in which to apply the test where quantities of strychnia to be detected were very minute. Failure often arose from the use of too much of the oxidizing agent, in which case the effect was so rapid, that the eye failed to follow it.—*London Pharm. Journ., March, 1857.*

members who were previously subscribers, and to such other members as have applied for it; a notice requesting all those who were members and who had complied with the resolution by having paid their annual contribution, having been inserted in the number following the passage of the resolution.

"The gradual accumulation of the stock of back volumes having become inconvenient in the Library room, it was suggested to throw a floor across the upper portion of the well of the staircase, and gain access to it from the upper lecture room. The Board having granted the right to proceed, the Committee have had the improvement carried out, at an expense of about twenty-five dollars. The space thus obtained is a room 6½ feet high, 6½ feet wide and 12 feet long, amply sufficient for the purpose intended, two sides having been shelved to hold the volumes."

CHARLES ELLIS,
WM. PROCTER, JR.,
EDW. PARRISH,
ROBERT BRIDGES,
A. B. TAYLOR,

March 30, 1857.

Publishing Committee.

A statement of the financial concerns of the Committee accompanied the Report.

The Sinking Fund Committee made a report showing that they have during the past year extinguished one share of the College Loan, and have in hand \$90 75.

The Latin Label Committee reported their operations for the past year, and in view of the small stock of yellow shop labels on hand, they were encouraged to publish an edition of yellow labels somewhat improved on the present, and also a smaller set for physician's offices; should the bronzed labels be sold before the next meeting, the Committee is authorized to issue another edition of these.

The Corresponding Secretary presented a pamphlet sent the College by M. Henri Buignet, Secretary of the Society of Pharmacy, Paris, on a new process for estimating carbonic acid in mineral water, &c., which was accepted.

The College being reminded that the Annual Meeting of the American Pharmaceutical Association will occur before the next meeting of the College, the following, on motion of T. P. James, was unanimously adopted:

Resolved, That we cordially invite the American Pharmaceutical Association to hold its sessions in the College Hall, and request the Board of Trustees to take timely action in order to secure the reception and proper accommodation of the members while in our city.

Information having been received that the Board of Trade of this city is about enlarging its membership by delegates from all the principal branches of trade and manufactures, the following Committee was ap-

pointed by this College to consider whether and in what way we can co-operate in the movement :—Charles Ellis, chairman, S. F. Troth, T. P. James, Edw. Parrish, C. Bullock and J. C. Savery.

The annual election was held, and resulted in the choice of the following officers for the ensuing year :

President.—CHARLES ELLIS.

1st Vice President.—S. F. Troth.

2d Vice President.—Dillwyn Parrish.

Recording Secretary.—Edward Parrish.

Corresponding Secretary.—Wm. Procter, Jr.

Treasurer.—Ambrose Smith.

Eight members of the Board of Trustees.

Dr. R. Bridges,	Wm. Hodgson, Jr.,
D. S. Jones,	J. C. Savery,
S. N. James,	T. S. Weigand,
S. S. Bunting,	F. C. Hill.

Delegates to the American Pharmaceutical Association.

D. Parrish,	Ambrose Smith,
Wm. Procter, Jr.,	Charles Bullock,
T. S. Weigand.	

Committee on Sinking Fund.

S. F. Troth,	Edward Parrish,
Ambrose Smith.	

Publication Committee.

Charles Ellis,	Dr. R. Bridges,
Wm. Procter, Jr.,	Edw. Parrish,
A. B. Taylor,	

Then, on motion, adjourned.

EDW. PARRISH, Secretary.

Minutes of the Maryland College of Pharmacy.

Baltimore, October 2d, 1856.

The College met and was called to order by the President at the usual hour ; twenty members present. The minutes of the last meeting were read and approved of.

Mr. Thompson read a paper on Tincture of Chloride of Iron, which was ordered to be placed on file. Mr. Roberts, offered for the consideration of the College, a formula for preparing Fluid Extract of Valerian, which was ordered to be entered on the minutes ; it is as follows : —

Take of Valerian in coarse powder half a pound.

Ether	. . .	four ounces.
Alcohol	. . .	twelve ounces.
Carbonate of Soda	. . .	half an ounce.
Diluted Alcohol	. . .	a sufficient quantity.

“Mix the Ether, Alcohol and Valerian; macerate for several days in a close vessel, then transfer to a displacement filter and pour on alcohol until you recover the quantity of menstruum first used. Evaporate, without the application of heat, to eight ounces. Upon the surface of the residue in the filter, sprinkle the carbonate of soda in fine powder, and pour on diluted alcohol until it passes nearly pure; evaporate the liquid thus obtained to eight ounces and add to the first product.” A sample of the fluid extract prepared as above was exhibited by Mr. Roberts; which is of dark color, clear, of uniform consistence, and seems to possess the active properties of the root in an eminent degree.

Mr. Sharp, in behalf of the different committees appointed by the Druggists and Pharmaceutists of the city, to make arrangements for the late Pharmaceutical dinner, presented the Collège with the sum of sixty-three dollars and twenty-five cents, it being the surplus after defraying all the expenses of the entertainment, which was accepted unanimously, with the thanks of the College.

No other business having been brought forward, the College adjourned.

Baltimore, November 6th, 1856.

The College met, and in absence of the President the meeting was called to order by the First Vice President, Mr. Grahame.

Mr. Thompson called the attention of the College to the specific gravity of the Commercial Inodorous Glycerin of American Manufacture. The standard sp. gr., given by the United States Pharmacopœia is 1.250, that of the Dublin 1.260. The sp. gr. of the sample he examined was 1.138 at 60° Fahrenheit. Four fluid ounces, weighing 2080 grains was reduced by evaporation over a water bath to 990 grains and the sp. gr. increased to 1.264; rather over the Dublin standard. The four fluid ounces he operated upon was reduced to less than two fluid ounces. On motion of Mr. Moore, the remarks of Mr. T. were ordered to be placed on the minutes, and he was requested to communicate with the Editor of the American Journal of Pharmacy on the subject.

A donation of specimens of Chemicals, &c., manufactured by Messrs. Rosengarten & Sons of Philadelphia, was received from those gentlemen, through Messrs. Thomsen, Woods and Block. The articles are forty-four in number, and are handsomely and tastefully put up. On motion of Mr. Phillips, the Secretary was directed to acknowledge their receipt with the thanks of the College, and also to return thanks to Messrs. Thomsen, Woods and Block, for their agency in the matter.

On motion of Mr. Moore, the Secretary was directed to express the thanks of the College to Mr. E. S. Wayne, of Cincinnati, for his very handsome donation of specimens of vegetable alkaloids, &c.

Mr. Moore gave notice of an amendment to the By-Laws which he proposes to offer at the December meeting; he proposes to add a new section to Law 6, as follows:—

Section 10. "All wholesale druggists may become contributing members, by a vote of a majority of the members present at any stated meeting of the College, on payment of an annual contribution of five dollars. They shall be entitled to all the privileges of Honorary Members."

After which, on motion the College adjourned.

MINUTES OF THE BOARD OF TRUSTEES.

The Board met after the adjournment of the College, six members present. Mr. Baxley offered the following resolution which was unanimously adopted.

Resolved That students of good moral character, who have been engaged in the Drug and Apothecary business over four years before the commencement of the present course of lectures, may graduate at its close upon passing the requisite examination. Adjourned.

MINUTES OF THE COLLEGE.

Baltimore, December 4th, 1856.

The College met, and was called to order by the President. Twelve members present. On motion of Mr. Moore, the amendment to the By-Laws proposed at the November meeting was unanimously adopted. The Secretary was ordered to notify the members that their annual contribution will be due at the January meeting. Adjourned.

MINUTES OF THE BOARD OF TRUSTEES.

Baltimore, December 27th, 1856.

The Board was called to order by the President. Seven members present. The following gentlemen were nominated for membership and duly elected; viz:—David F. Ricketts, Wm. L. Jung, Edward Kaufman and Thomas Edward Kirby. After which the Board adjourned.

W. S. THOMPSON, Secretary.

MINUTES OF THE COLLEGE.

Baltimore, January 1st, 1857.

The College met and was called to order by the President. The Secretary being absent, Mr. Phillips was appointed Secretary pro tem.

The Treasurer presented his Semi-Annual Statement ending December 31st, 1856, as follows:—

Balance on hand as per July report,	\$138.53
Amount received from July 1st to December 31st,	160.75
	<hr/>
Total,	\$299.28
Disbursements for the same period, per vouchers,	296.02
	<hr/>

Balance in hand December 31st, 1856,	\$3.26
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On motion a Committee of three was appointed to examine the Treasurer's account, and to report thereupon at the next meeting.

Mr. Baxley nominated for contributing members Messrs. J. Jacob Thomsen, G. Davidge Woods, John Block and Solomon King, who were unanimously elected.

Messrs. Sharp and Moore were nominated for Examiners, and upon ballot were elected.

This being the regular meeting for the election of two Vice Presidents and two of the Board of Examiners, Mr. I. J. Grahame was nominated for the first, and Messrs. J. W. Barry and L. Phillips for the second, Vice President. Upon the ballot being taken, Messrs. Grahame and Phillips were elected.

On motion of Mr. Baxley the College adjourned to Thursday, 15th inst. at 3½ o'clock, P. M.

L. PHILLIPS, Sec. pro tem.

MINUTES OF THE BOARD OF TRUSTEES.

Baltimore, January 1st, 1857.

After the adjournment of the College, the Board of Trustees met, five members present. Upon a favorable report from the Board of Examiners, Mr. Wm. T. Ely was elected a member of the College. Adjourned.

MINUTES OF THE COLLEGE.

Baltimore, January 15th, 1857.

The College met by adjournment. In absence of the President, the first Vice President took the chair, and called the meeting to order.

Mr. Phillips offered the following resolution, which after some discussion was adopted.

Resolved, That a Committee of three be appointed, who shall take into consideration and report at our next meeting, the best means and plans for carrying out the objects of this College, in regard to essays, discussions and all subjects bearing upon the profession of Pharmacy. Messrs. Phillips, Andrews and Lemmon were named as the Committee.

Mr. Grahame exhibited a sample of Syrup of Poppies prepared with diluted alcohol as the menstruum, as recommended by Prof. Wood in the United States Dispensatory; which seems to possess some advantage over the processes of the London and Edinburg Pharmacopœias. Adjourned.

MINUTES OF THE BOARD OF TRUSTEES.

Baltimore, January 23d, 1857.

The Board met upon call of the Chairman. Present all the members. Mr. Grahame stated that the object of the meeting was to fix a time for the candidates for graduation to present their inaugural essays, when upon motion the time was limited to 25th February ensuing.

Mr. Phillips offered the following resolution, which was adopted:

Resolved, That the Professors be requested to affix their signatures and name of branch to each Diploma granted by the Board of Trustees,

Mr. Sharp offered the following resolution, which was adopted :

Resolved, That a committee be appointed to investigate the recent cases of poisoning by Cyanide of Potassium in mistake for Chlorate of Potassa.

On motion of Mr. Baxley, Messrs. Andrews, Sharp, and Phillips were appointed as the committee.

Mr. Richard Willis having been nominated for membership, was duly elected. Adjourned.

MINUTES OF THE COLLEGE.—SPECIAL MEETING.

Baltimore, January 30th, 1857.

The College met upon call of the President. Thirteen members present; the President in the chair. After calling the meeting to order, the President stated that the College was called together to hear and act upon a report of a Committee appointed at the meeting of the Board of Trustees, on the 23d inst., to investigate the circumstances of the late fatal mistake made by the proprietor of a drug store in this city.

The Committee then presented their report, which was adopted by the College.*

MINUTES OF THE COLLEGE.

Baltimore, February 5th, 1857.

The College met, and was called to order by the President. Fifteen members present.

The Committee appointed at the meeting of 15th of January "to take into consideration and report the best means and plans for carrying out the objects of the College, &c.," offered the following report and resolutions, which were adopted after some discussion :

The undersigned, to whom was referred the resolutions of Mr. Phillips, to consider and report the best means and plans for promoting the objects of the College, in regard to essays, discussions and subjects bearing upon the profession of Pharmacy, respectfully submit, that for the present they consider it inexpedient to propose plans for meeting the entire objects of the resolution, but conceive that the revision of the processes for the preparations of the U. S. Pharmacopœia is desirable to be entered into by this College; they therefore offer the following resolution :

Resolved, That at each stated meeting of the College, the Chairman shall submit a list of preparations of the U. S. Pharmacopœia, and each member shall select one or more subjects and report thereon. The member, upon the acceptance of the subject assigned to him, shall make as minute examinations of it as possible, in everything of interest, as to its sensible properties, constituents, solubility in different menstrua; its tendency to change or decomposition, and appearance as made by different formulæ, as

*The Report and the resolutions appended to it were published in the March number of this Journal, page 189.

they may have come under his notice, and report thereon in writing at the next stated meeting, if possible.

If, in the examination of the processes of the U. S. Pharmacopeia, he shall conceive that its mode of preparation is preferable, he shall compare it with the other processes for the same preparation, which have been employed or suggested and come to his knowledge, and detail its advantages, &c.

If he shall adopt the formula of either of the British or Continental European Pharmacopeias for his subject, he shall state his reasons therefor, and if he shall suggest a process of his own, or adopt the formula recommended by another, which he conceives to be preferable, he shall detail such process or suggestions for processes in full, with his reasons for his preference.

All precaution should be taken when following the formula of the U. S. or other Pharmacopeias, according to directions, in the employment of temperature, evaporation, percolation, or maceration, density and state of mechanical division, and menstrua of proper strength, and also in the processes suggested in the place of those of the U. S. Pharmacopeia.

He shall render a written report and submit a specimen of his preparation, properly labelled and marked (so as to be easily referred to on the file) which shall be the property of the College.

Submitted by

L. PHILLIPS,

In behalf of the Committee.

Mr. Moore offered the following resolution, which was adopted.

Resolved, That a list of the Officers and active members of the College be published by the Secretary, in the American and Sun Newspapers, immediately succeeding the January and July meeting, with a notice of the election of officers.

Messrs. Wm. H. Brown and A. Vogeler, having been nominated, were unanimously elected contributing members. Adjourned.

MINUTES OF THE BOARD OF TRUSTEES.

Baltimore, February 5th, 1857.

The Board met, and was called to order by the President, all the members present. Mr. Sharp nominated Mr. Lloyd Dorsay for membership, who was unanimously elected.

On motion of Mr. Moore, the Treasurer was authorized to employ a collector to call on those members who have not paid their annual contributions.

The Curator was authorised to confer with Professor Steiner in relation to the cost of Chemical Apparatus, purchased by him for the use of the College.

The Curator was also ordered to procure a copy of the U. S. Dispensary, and a copy of Fowne's Manual of Chemistry. Adjourned.

Baltimore, February 17th, 1857.

The Board met at 4 o'clock, P. M. All the members present; the President in the Chair.

Professor Grahame stated that the object of the meeting was to fix upon a day for the examination of candidates for graduation, and on his motion the day fixed upon was Monday, 2d March.

On motion of Mr. Roberts, the Board resolved itself into a Committee of the whole to examine the candidates in conjunction with the Professors.

On motion, the Curator was authorized to engage the large room of the Masonic Hall, for the Commencement, and to confer with the Professors in regard to the time of holding, and to make the proper arrangement for the Commencement.

On motion of Mr. Phillips, the President was authorised to deliver the diplomas with appropriate remarks to the graduates. Adjourned.

MINUTES OF THE COLLEGE.

Baltimore, March 5th, 1857.

The College met, and was called to order by the President, fourteen members present.

Mr. Sharp read a paper on Syrup and Spiced Syrup of Rhubarb, and exhibited specimens of the preparations, which were deposited in the Cabinet of the College and the paper was ordered to be placed on file.

Mr. Roberts read a paper on Vinous Tinctures, Syrup of Ipecacuanha, and Acetous Syrup of Ipecacuanha, and exhibited specimens of the preparations. The paper was ordered to be placed on file, and the specimens were deposited in the Cabinet of the College.

Professor Grahame read a paper on Savin Ointment, and exhibited a specimen of the Ointment, but requested permission to withdraw the paper for the purpose of re-writing it; which was granted.

Mr. Phillips offered the following resolutions, which were adopted:

Resolved, That a committee of three be appointed by the President, to take charge of all communications in reference to revision of the Pharmacopœia.

Resolved, That any communication on the revision of the Pharmacopœia may be open for debate at any stated meeting of the College, subsequently to the one at which it is offered.

The Chairman appointed the following gentlemen as the committee proposed by Mr. Phillips' resolution: viz. Messrs. Phillips, Roberts and Lemmon.

Mr. Phillips then moved that all previous communications in reference to preparations of the Pharmacopœia be handed over to the Committee by the Secretary, and that the Committee be authorized to procure a book in which to register all such communications. The motion was concurred in.

The Chairman, in behalf of the Board of Trustees, announced the following gentlemen as graduates of the College, viz.

Louis Dohme, of Maryland,	Thesis,	Valerianic Acid.
E. Walton Russell, N. Hampshire,	"	Displacement.
Joseph C. O'Brien, Maryland,	"	Sanguinaria Canadense.
J. Emory Weatherby, New Jersey,	"	Pharmacy.

On motion of Mr. Moore, the Chairman appointed the following gentlemen to act as a committee of reception in conjunction with the students, at the Commencement on Friday evening next, 6th inst. viz. Messrs. Dorsay, Woods, Jennings, Willis and Jung.

No other business having been brought forward, the College adjourned.
W. S. THOMPSON, Secretary.

Editorial Department.

NEXT MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The next meeting of the Association convenes in this city on the 8th of September of the current year. As yet we have received no official notice from the President for publication, but in order to remind the members and others of the rapid approach of the time of meeting this notice has been introduced.

As there are a number of committees on important subjects to report, it is hoped that many pharmacutists and druggists having business in Philadelphia or New York will find it convenient to attend the meeting and participate in its proceedings. All who have objects of interest in chemistry, materia medica or pharmacy, or may have made new observation pertaining to pharmacy, are encouraged to bring them to the meeting. The prospect is fair for having a numerous and interesting gathering.

RARE SPECIMENS OF THE MATERIA MEDICA.—Since our last issue we have been gratified by the reception of a box of interesting and rare specimens of the materia medica, mostly of East Indian origin, from Mr. Daniel Hanbury of London, who has also contributed a paper to this number on Malambo Bark. The following is a list of the contents of the box, viz:

Cortex Malambo.

- " Copalchi, quilled, Pereira, *Elem. of Mat. Med.* Ed. 3, vol. ii. p. 1284.
- " Copalchi, corky, from San Blas, described in *Pharm. Journ. and Trans.* vol. ix. p. 463.
- " Winteranus, of the English shops. Origin unknown.
- " Winteranus Mexicanus (? *Drimys Mexicana* De C.; *D. Winteri* Forst.)
- " Alyxia (Alyxia Stellata, Roxb.)
- " Thymiamatis, or Storax bark. Pereira, *Elem. of Mat. Med.* Ed. 3, vol. ii. p. 1518.

Brazilian Cinnamon.

- Cardamoms, Korarima, Pereira, *Elem. of Mat. Med.* Ed. 3, vol. ii. p. 1136, fig. 245, 246, 247.
- “ Round or cluster, *Amomum cardamomum* L.
- “ Ovoid China, *Pharm. Journ. and Trans.* vol. xiv. p. 419.
- “ Galanga. *Alpinia Galanga* Willd. *Pharm. Journ. and Trans.* vol. xiv. p. 420.
- “ Bitter-seeded, *Pharm. Journ. and Trans.* vol. xiv. p. 418.
- “ Ceylon, *Elettaria Major*, Smith.
- Leaves of *Globularia Alypum* L. *Wild senna* C. Martius in *Pharm. Journ. and Trans.* vol. xvi. p. 426.
- Flowerbuds of *Calysaccion longifolium* Wight. vide *ibid.* vol. x. p. 449, 597; vol. xii. p. 62.
- Prepared Coffee leaves, from Sumatra. *Pharm. Journ. and Trans.* vol. xiii. p. 207.
- Wood of *Coscinum fenistratum* Colebr. *Calumba wood*, *ibid.* vol. x. p. 321, vol. xii. p. 185.
- Savanilla Rhatany, *ibid.* vol. xvi. p. 29.
- Bokhara Galls, *Pharm. Journ. and Trans.* vol. iii. 386.
- Bush Tea of the Cape of Good Hope. *Cyclopia latifolia* De C. *ibid.* vol. xviii. p. 172.
- Fruits of *Euphoria Longan* Lam., from China.
- Shea Butter, *Bassia Parkii* G. Don. West Africa.
- Mecca Balsam, genuine, sent from Constantinople to the Great Exhibition of 1851.
- Strasburg Turpentine; Terebinthina Argentoratensis; *Pinus picea* L.
- Burgundy Pitch, genuine. } from *Abies Excelsa* De C.
- Gum Thus, “ }
- Venice Turpentine, *Larix Europea* De C.
- Scammony, very fine.
- Wood oil, from Moulmein. *Pharm. Journ. and Trans.* vol. xv. p. 321.
- Penghawar Djambi, *ibid.* xvi. 278.

IODINE WATER.—In the March number of this Journal, we took occasion to notice a liquid introduced to the public under the name of “Liquid Iodine,” a bottle of which had been sent to us for examination by the proprietors, who claimed it to be a solution of iodine in pure water of the strength of half a grain to the fluid ounce; and to possess curative powers exceeding any other preparation of iodine. In preparing the notice we first tested the strength of the solution, and then remarked on the extraordinary merit it was alleged to possess.

Since then we have received the following communication from the proprietors, and although we feel disinclined to occupy so much space with so little profit to our readers, yet, inasmuch as we inadvertently did some injustice to the specimen sent to us, as will be explained in the sequel, we will insert the letter in full.

No. 3 Second Avenue,
NEW YORK, March 16th, 1857. }

MR. WM. PROCTER, JR., Editor American Journal of Pharmacy :

SIR,—The March number of your “Journal” contains some editorial remarks upon the subject of “Anders’ Liquid Iodine.” We are the proprietors of that well known preparation, and feel it due both to ourselves and the public, to correct the errors into which, it is evident from the tenor of your observations, you have inadvertently fallen. Allow us, in the first place, to reply to those observations seriatim.

You say that we claim the Liquid Iodine to be “a solution of pure iodine in water *without any solvent*.” You italicize the last three words, and append to

them a note of exclamation in a parenthesis, thus (!): thus implying, without asserting a doubt.

Now, sir, we *do* claim our preparation to be, openly and unequivocally, that very desideratum in medicine, *a solution of pure iodine in water*, and nothing else. We have the certificates of some of the ablest analytical chemists in the country to that effect.

You also state that, "admitting the amount of iodine averred, it is most probably held in solution by traces of hydriodic acid, and *not* by pure water."

Dr. James R. Chilton, the distinguished Chemist of this city, contradicts you somewhat emphatically. He observes in his certificate—

"I have analyzed the 'IODINE WATER,' prepared by Dr. Anders, and find it to be a solution of pure iodine in water. It has long been a desideratum to prepare iodine so that it can be administered in its uncombined state; this preparation, by Dr. Anders, enables us to effect that object."

Prof. James C. Booth, of your city (U. S. Mint) also differs materially from you in this opinion; he observes:

"DR. HENRY ANDERS:—The sample of Iodine Water, tested by me, I find to be iodine dissolved in pure water."

We might furnish you with many more proofs equally satisfactory upon this head, but conceive it unnecessary. We are quite willing to leave you most probably in the *per contra* to positive statements of facts made by gentlemen of such standing in the world of science.

You next suggest another doubt in regard to the strength of our solution, but qualify it with the remark that "the specimen tried had been kept some time in a warm room."

Permit us, in reply, to observe that our preparation loses none of its strength whatever in a warm room. Dr. Chilton, in his analysis of it, states, "Each fluid ounce of the water contains about half a grain of iodine." Other chemists, after analyzation, have certified to the same effect, and some of the Iodine Water thus tested, had been standing upon our shelves in a warm room over two years.

But your most serious charge is that of "presumption and effrontery" in us for daring to assert that, "in view of its actual composition, 'Anders' Liquid Iodine, or Pure Iodine Water,' always effects a cure" in cases of consumption, palsy, rheumatism, scrofula, liver complaints, heart diseases, and disorders arising from impurities of the blood.

It seems to us that "presumption and effrontery," if their be any in the premises, might much more readily be found in the gratuitous denial of the efficacy of our preparation by one who has never yet seen it tried, and whose view of its composition is wholly apocryphal. Our affirmation of the remedial effects of the "Liquid Iodine" is based upon the direct testimony of experience, and is corroborated by the faith of over two hundred grateful men and women, who, by its instrumentality, have been restored to perfect health.

The "absurdity," as you think proper to term it, of "supposing that this solution has more merit than Lugol's, is simply the "absurdity" of supposing that iodine dissolved in water only will exhibit more specifically the effects of that element than if dissolved in combination with potassium—an "absurdity" admitted by Lugol himself, as well as by many other medical writers—an "absurdity" admitted even by such respectable authority as the U. S. Dispensatory.

It is well known that iodine, when combined with potassium, is rarely exhibited with a satisfactory result; with some systems it disagrees altogether, and with others the consequences are strikingly mischievous, nor is the prescription improved, as you seem to suggest, by the addition of the sweet spirit of nitre. Two grains of pure iodine dissolved in one ounce of the latter may be diluted with eight ounces of water, and the iodine held in solution will be found to reach the seven-thousandth part, the remainder will chiefly be discovered in precipitation at the bottom of the vessel; a common solution of iodine in water holds just as much; of what use, then is the nitre? A quart of such a mixture would contain about two grains of iodine; the same quantity of our

"very dilute" preparation, as you denominate it, would contain from sixteen to twenty-four.

To conclude, Dr. Anders' Liquid Iodine not only professes to be, but it is a simple and scientific substitute for the combinations of iodine, without any counteracting solvent whatever. In these combinations the iodine is never wholly dissolved; when exhibited it is frequently precipitated upon the mucous membrane of the throat or the coats of the stomach, inflammation ensues, and sometimes the most fatal results follow. In "Anders' Liquid Iodine," on the contrary, the iodine is held in complete solution, and in pure water. The physician is enabled to administer it in whatever state of dilution the circumstances may demand, and the specific effects of pure iodine upon the system may be unfailingly anticipated. These effects we have already described, and stand prepared to prove by indisputable testimony—testimony not to be overthrown by the mere doubts and cavillings of the incredulous.

Yours truly,

ANDERS & FOSDICK.

On reading the above there arose no question in our mind that the analysis given by us was a correct expression of the strength of the solution at the time it was examined; but on reflection we remembered that on the day the bottle was left with us, it was accidentally broken and a part of the contents lost, as we stated at the time to Dr. Anders' agent; the residue was put in a bottle and stopped with a cork, where it remained about five weeks before it was examined. At that time the action of the iodine on the cork was not noticed, and hence not regarded; but on the reception of Dr. Anders' note, on again examining the bottle, we found it perfectly tight, but the liquid *nearly colorless*, whilst the inner end of the cork was corroded, iodous and strongly acid when applied to litmus paper, showing that the iodine had been gradually acting on the cork, so as to form hydriodic acid, which in its turn absorbed more iodine, until nearly the whole of the latter had been abstracted from the water. On this discovery we wrote to Dr. Anders' agent requesting a fresh sample for examination, and on applying the same means of analysis, a fluid ounce of the solution yielded a fraction over half a grain (-5035 gr.). This result, whilst it corroborates the analyses of Chilton and Booth, as regards the proportion of iodine, shows a curious source of deterioration, and points to the necessity of avoiding cork stoppers in liquids containing free iodine.

In reference to the solubility of iodine in pure water, the best authorities (Gay Lussac) state it to require 7,000 times its weight of water, or one grain to an avoirdupois pound, whilst in the "iodine water" it is one grain to about 900 grains, or near eight times as strong. Now either the universally received idea of its solubility is incorrect, or the iodine in Dr. Anders' preparation is held in solution by some other agent than water.

Gmelin (Handbook, vol. ii. p. 251.) says, "A brown solution of iodine loses its color by exposure to the direct rays of the sun, either exposed, or in perfectly stopped bottles, provided some air is enclosed. This decolorized solution, if brought in contact with more iodine, acquires a permanent orange yellow tint. From this it would appear that the decolorized liquid contains hydriodic acid, which by taking up an additional quantity of iodine is converted into *hydriodous* acid. (Gmelin.)"

Now if this statement be true, all that is necessary to make "iodine water" is to put an excess of iodine in water and expose it in the sun, hydriodic acid will be generated, which will become a solvent for more iodine, and thus increase the strength of the solution far beyond the capacity of pure water. To test its truth, we triturated a scruple of dry resublimed iodine with twelve fluid ounces of water, enclosed it in a glass stopped bottle and placed it in the sun's rays at intervals for two days. On testing it, a fluid ounce was found to contain .4105 gr. of iodine, whereas, according to Gay Lussac, it should have retained when made first but .0642 gr.

We then added a few drops of liquid hydriodic acid to water containing iodine, when its solvent power was increased many fold. We believe, therefore, that a solution of iodine, of the strength of the so-called "Iodine Water," may be prepared by exposing water with a considerable excess of iodine to the direct rays of the sun, and that any apothecary may keep a supply, by using one of his window show bottles as a vessel for its preparation, at a cost of two cents a pint.

As regards the statements of Dr. Chilton and Prof. Booth, which Dr. Anders' considers so annihilating, we believe they were intended to prove the absence of substances having a modifying influence on the medicinal powers of iodine; and further, that, unless specially sought for, they would not be likely to detect a minute proportion of hydriodic acid. Until those gentlemen are prepared to state, over their signatures, that there is no hydriodic acid present in the "Iodine water" of Dr. Anders, we shall feel perfectly safe to remain "in the *per contra*."

We are not acquainted with the proprietors, and hence speak without personal feeling. They may be sincere in believing that they have succeeded in changing the solubility of iodine in water, and self deceived in regard to the superlative merits they claim for their preparation; such instances sometimes occur; nevertheless, we cannot withdraw one tittle of our averment, that a declaration that this, or any other preparation, "is a complete and certain cure for consumption, palsy, rheumatism, scrofula, liver complaints, heart diseases, &c.," and that "it always effects a cure," savors of "presumption and effrontery" of the most glaring kind, and is calculated by its boldness to excite the hope of thousands of unfortunate invalids only to precipitate them in disappointment.

Apart from these undeserved claims, we believe that an aqueous solution of iodine is a valuable form for the administration of that remedy, and one toward which physicians should turn their attention. It is not at all improbable, as we said before, that the careless use of an alcoholic solution of iodine frequently occasions gastric irritation: and even Lugol's solution, if not properly diluted, may do the same; yet we believe that six drops of Lugol's solution (containing a quarter of a grain of iodine) diluted in a table spoonful of water, will be equal in all respects, so far as regards the specific effects of iodine, with a like quantity of "Iodine water." As it is

perfectly easy to prepare an aqueous solution with a quarter of a grain to the table-spoonful, by aid of spontaneously generated hydriodic acid, as before alluded to, its administration in this form to children of scrofulous habits, where iodine treatment is to be long persisted in, is certainly a safe and eligible method.

Dr. Anders' remarks in reference to what we said about sweet spirits of nitre and iodide of potassium he had better have omitted, as he has totally misunderstood our meaning and aim.

Finally we will remark that Dr. Anders' declaration, in his concluding paragraph, that "iodine is never wholly dissolved by aid of iodide of potassium, hydriodic acid, etc.," is entirely incorrect and unchemical; such solvents have no analogy to the alcohol in tincture of iodine, which by mixture with water necessarily loses its solvent power, and suffers the iodine to be precipitated in a solid form, whilst in the other cases no amount of dilution causes them to precipitate the iodine.

Dr. Bache (U. S. Disp. 10 Edit. 413-1341) so far from disapproving of these solvents, quotes Dr. Buchanan, of Edinburg, to show that hydriodic acid is the best form to exhibit iodine to get its specific effects without irritation, and that iodine taken in a free state becomes hydriodic acid in the stomach by contact with organic matter.

Dr. Wood (*Therap. and Pharmacol.* ii. p. 342) says, "the probabilities are that, when swallowed, or brought in any other way in contact with the fluids of the body, it undergoes changes through the reagency of the alkaline salts which it encounters, by which a portion of it is converted into iodide of potassium or sodium," &c., and further on he says, "so that it would seem impossible for iodine to enter the blood in its uncombined state."

THAYER'S SOLID EXTRACTS.—Dr. Henry Thayer, of Boston, has sent to us specimens of Extracts of Taraxacum, Juglans, Uva Ursi, Humulus Hyoscyamus, Belladonna and Conium, all of which are marked "by displacement—in vacuo," which we presume means that the substances were extracted by displacement and the solutions evaporated in vacuo. The appearance of these extracts is good. Their consistence rather soft for making pills, though convenient for some other purposes of pharmacy. The Taraxacum has a brown color and decided odor of the bruised root, with a fair proportion of its bitterness. There is probably no extract that varies so much as made at different times and by different manufacturers. The extract of Conium, so far as can be judged by appearance, taste, odor and chemical tests, is of excellent quality, but we have had no opportunity to have it or any of the others tried therapeutically. The Belladonna and Hyoscyamus are made from the imported leaves. All of the labels have the abbreviation "Purif." attached to the name; as, for instance "Ext. Conii Purif." We suppose this is intended to indicate that they are *pure* extracts and not *purified* extracts as the affix indicates, which might mean that they are made from materials requiring purification. The samples are enclosed in queensware jars, and are neatly put up.

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JULY, 1857.

TINCTURA FERRI CHLORIDI.

By EDWARD R. SQUIBB, M. D., U. S. Navy.

Assistant Director U. S. Naval Laboratory, New York.

Careful pharmacutists very often meet with difficulty in making this preparation in accordance with the officinal (U. S. P.) formula, whilst those less careful obtain a preparation very deficient in the iron, but containing an excess of hydrochloric acid.

Freshly made subcarbonate of iron, if dried at a temperature below 100° F., will almost always dissolve in the prescribed proportion of acid. If, however, the subcarbonate be not recently made, or if it be washed often with hot water in the preparation, even though dried "with a gentle heat," a notable proportion of it will resist the action of the acid. The common faults in its preparation are the washing with "hot water," and drying at a temperature above the prescribed "gentle heat."

The preparation of a soluble subcarbonate has been more uniformly successfully accomplished in the writer's hands by precipitating from warm, not hot solutions, washing the precipitate with cold water, by decantation, and drying at a "gentle heat," or below it. In practice with all preparations of sesquioxide of iron the writer's observations are entirely in accordance with the recent experiments and researches of M. Péan de Saint Gilles, (*Ann. de Chem. et de Phys.* 1856. Vol. xlv. p. 47, et seq.) wherein he concludes "that the action of heat upon hydrated sesquioxide of iron determines first a partial elimination of water; then, when the action is prolonged, it destroys little by little the basic affinities of the oxide and produces a true allotropic transformation."

In the preparation of the tincture of the chloride from a solu-

in strength, the preparation will not remain clear ; for the officinal subcarbonate always contains a little carbonate of protoxide, which latter forms protochloride at first. This protochloride is afterward gradually decomposed, and forms sesquichloride and sesquioxide, when, through the deficiency of acid, the oxide is deposited as a sediment.

The filtering of the solution of chloride of iron of the Pharmacopœia process is very tedious and troublesome, and cannot be rendered less so by any ordinary management ; so that although the process is in principle unobjectionable, it is yet so difficult and troublesome in practice that perhaps very few follow it with success.

If the subcarbonate be replaced by magma of hydrated sesquioxide, the saturation of the acid is easily accomplished ; but, with the slightest excess of magma the filtering becomes more difficult than before, or is almost impossible. In the use of this substitute for some time, the difficulty in the filtration was in great measure avoided by subtracting one thirty-second part of the prescribed acid, then saturating the remainder as nicely as practicable, and finally restoring the portion of acid separated, and digesting before filtration. In this way an excellent preparation was obtained, having the strength of the acid for an index of strength and uniformity.

A much better, because a much easier, more simple and more direct process is that now adopted. This is a mere adaptation of the old process for obtaining pure sesquichloride of iron, and is used as follows, the quantities being five times greater than those of the officinal formula.

Take of Iron filings or card teeth, 18 $\bar{3}$ = 1lb. 4oz. Av.

Muriatic acid, (s. g. 1.16) 5 pints = 5lbs. 14oz.

Nitric acid, (s. g. 1.42) Q. S. say 4 $\frac{3}{4}$ f.℥. = 7 $\frac{1}{2}$ oz.

Alcohol, (s. g. .835) 15 pints.

Distilled water, 3 pints.

To the iron filings placed in a ten pint flask add 3 pints 4 $\frac{1}{2}$ f.℥. = 3lbs. 14oz. av., of the muriatic acid and 8f.℥. of the distilled water. When the spontaneous reaction has subsided, boil gently for four hours, add one pint of distilled water, heat again to boiling, and strain off the hot solution. Wash the flask and residue with 8f.℥. of distilled water, and rinse the strainer through with ble subcarbonate, if the acid be in the smallest degree deficient

the washings, receiving them into the original solution. To the strained solution, in a flask, add the remainder of the muriatic acid and heat the mixture. Then add, by small portions, the nitric acid until it falls into the hot mixture without effervescence, boil for half an hour and set aside to cool. When cold make up the measure to five pints with distilled water, and add the solution to the alcohol.

The yield of finished tincture is $19\frac{1}{2}$ pints; and the s. g. .992. One fluid ounce = 456 grains of this tincture yields 32.04 grains = 7 per cent. of sesquioxide of iron, or, 64.8 grains = 14.2 per cent. of sesquichloride of iron.

If the acid be of the prescribed strength the proportion indicated dissolves $15\frac{3}{4}$ oz. of the iron, leaving a residue of $4\frac{1}{4}$ oz. A calculation upon this basis gives 63.94 grains as the proportion of Fe_2Cl_3 in solution in each fluid ounce, thus verifying the direct experiments within .86 grain.

The flask is best heated on a sand bath during the saturation, and the point of saturation is determined within practical limits by removing the flask, and observing that when the boiling has completely ceased but few bubbles of hydrogen rise from the residuary iron. The time required for saturation varies, that named being the maximum. The solution is now of a beautiful deep green color, and contains protochloride of iron free from sesquichloride, in proportion as the iron used was free from sesquioxide, and in proportion as access of air has been prevented, but it is so concentrated that it deposits crystals of $\text{FeCl} + 4\text{Ho}$, as soon as it begins to cool. Hence the necessity for adding the pint of distilled water, and heating up before attempting to strain. The straining (through muslin) is easily and quickly effected, and with little loss. The strained solution need not be heated to boiling before the additions of the nitric acid are commenced; and the additions should be cautiously and carefully made at first, that the violence of the reaction may not cause loss of liquid with the extricated vapors, and toward the close that an excess of nitric acid may be avoided. As soon as the acid, added in drops, falls quietly into the surface of the hot solution the purpose is fully accomplished. The half hour after boiling is useful in driving off the oxides of nitrogen that may have been dissolved, but should be shortened or omitted altogether in operating

with small quantities lest the small excess of muriatic acid needed in the tincture be lost or reduced. As the nitric acid is added the color of the solution changes rapidly to brown, and when the acid ceases to produce effervescence the solution gives a negative indication with the 3KCy , Fe_2Cy_3 test solution.

The finished solution being perfectly clear and bright requires no filtration. When cold, made up to the measure, and mixed with the alcohol, a contraction of volume occurs equal to 7 or 8f.3 or about two per cent. by volume, and a fine effervescence occurs coincidentally with slight rise of temperature.

If the iron be pure, (free from silica and alumina,) and the small excess of HCl be not driven off, this tincture keeps well and free from turbidity or deposit, and has the important proportion of hydrochloric ether necessary to its proper medicinal action in certain cases. As this ether, whatever its precise nature or composition may be, is gradually formed, and probably through the excess of HCl , and as it is important if not indispensable to the proper effect of the tincture in spasmodic affections of the urinary organs, the preparation should not be used when newly made. It probably becomes better the longer it is kept.

Naval Laboratory, New York, May 1857.

ON FLUID EXTRACT OF ARNICA.

By J. M. MAISCH.

In several establishments in New York, an article is sold under the name of extract or fluid extract of arnica, and recommended as an external application for sprains, bruises, insect bites, &c., for which the tincture of arnica is usually employed as a domestic remedy. I have not seen any formula for the preparation of this fluid extract, and have therefore endeavored to find one, by which all the medicinal virtues residing in the arnica flowers might be preserved. The flowers as well as the root, both of which have been employed medicinally, have not been subject of chemical analysis for upwards of ten years, and we therefore know comparatively but little of their constituents. According to the old analysis of Chevallier and Lassaigne the flowers contain besides anorganic salts, albumen, gum, coloring matter,

gallic acid, resin, a little volatile oil and a brown acid extractive matter, to which they applied the name of arnicine, and which probably contains the *arnicina* of Mr. Bastick. From this statement it would appear that alcohol is the best menstruum for extracting the flowers, inasmuch as it will dissolve the gallic acid, resin, volatile oil, and the so-called arnicine. In accordance with these suggestions I took of

Alcohol	a sufficient quantity,
Arnica flowers	℥xvj.
Alcohol, 95 per cent.	Oiss.

and exhausted the flowers, which had been previously passed through the mill, by the alcohol, and evaporated the liquid to eight fluid ounces which were mixed with the 95 per cent. alcohol, well shaken, and after several hours filtered. The preparation seemed to possess in a high degree the medicinal virtues of the flowers, which in the form of a tincture have made them a popular remedy for external application.

The tincture is prepared with diluted alcohol, which accordingly would seem a good menstruum for exhaustion. I have therefore recently altered the above process somewhat by substituting diluted alcohol for alcohol, evaporating the resulting tincture by means of a water bath to the consistency of an extract, and redissolving it by two pints of ordinary alcohol; or the evaporation might be stopped when the liquid measures four fluid ounces, which would have to be mixed with 28 oz. of 95 per cent. alcohol, thus bringing the alcohol down to about 85 per cent., the official strength.

Prepared in either way, this fluid extract is of a dark brownish color, possessing in some degree the peculiar odor of the flowers; its strength compares with that of the fluid extract of valerian, containing the virtues of one ounce (Troy) in 2 fl. oz.; of this strength it might perhaps be found useful as an addition to rubefacient liniments and for the bites of insects. I have tried it often with musquito bites; they are little troublesome after the application of but a few drops, and the inflammation which usually follows, is in most cases easily arrested if the application be not deferred too long.

Philadelphia, May, 1857.

ON THE SEEDS OF STRYCHNOS IGNATIA.

By JAMES M. CALDWELL.

(An Inaugural Essay.)

Our knowledge of this plant is derived almost entirely from the Jesuits, who conferred upon it the name of the founder of their order, as an evidence of the high esteem with which they regarded it. But little attention however had been bestowed upon it by the medical world, till a printed notice, published by a clergyman of a sister State, detailing the beneficial results he derived from the use of an alcoholic extract of the beans, attracted the attention of medical men, who having witnessed the results of numerous and carefully conducted experiments, have settled the fact of its being, as might be expected, a remedy of great power, and, under judicious advice, a valuable addition to our list of *Materia Medica*.

Description of the Plant.—"This tree is indigenous to the Phillipine Islands, and is described as the product of the *Ignatia amara* by the younger Linnæus; as it is now considered by botanists as a species of *Strychnos*, it is therefore called the *Strychnos Ignatia*. It is a tree of middling size, with long cylindrical vine-like branches, which bear opposite, nearly sessile, oval, pointed, entire and very smooth leaves. The flowers are white, tubular, fragrant, and arranged in short axillary racemes. The fruit is about the size and shape of a pear, with a smooth, whitish, ligneous rind, enclosing about twenty seeds, embedded in a dry pulpy matter, and lying one upon the other." (Wood & Bache.)

Appearance of the Beans.—We very rarely, if ever, obtain the beans in the attached state, or in the form of the fruit. As found in commerce they vary from half an inch to an inch in length, from a quarter to half an inch in breadth, and somewhat less in thickness. They are somewhat convex on one side, having three or four faces on the other. Others again are very irregular, and much compressed. They vary in color from a grayish brown to a black, and when contused present a reddish brown appearance, and the particles are slightly translucent. They are very hard and horny, and difficult of pulverization, inodorous in the dried state, and intensely bitter.

Strychnia.—These beans contain a larger per-centage of this alkaloid than the *strychnos nux vomica*. I employed the following process for isolating it :

Two thousand Troy grains of finely contused beans, were macerated in cold water, acidulated with muriatic acid for ten days. The clear liquid was then decanted, and the residue subjected to contusion with an equal bulk of well washed sand ; this was heated in a water bath with the addition of a pint of acidulated water for one hour, and again contused with more sand ; by this process the residue was reduced to a pulpy mass, which was introduced into a glass displacement apparatus, and the liquid obtained by the first maceration allowed to percolate slowly through it ; the displacement process was then continued until the mass was completely deprived of its bitterness.

The liquids obtained by displacement were mixed and evaporated to the consistence of a syrup, and the gum precipitated by alcohol. The alcoholic solution was then filtered and evaporated over a water bath to the consistence of an extract, this extract was dissolved in cold water, and by this means the muriate of strychnia, being a soluble salt, is obtained in solution, and the fatty matter, which exists in small quantities, is also separated. This solution was next heated, and the strychnia precipitated by a slight excess of the milk of lime, and allowed to stand for several hours. The precipitate was carefully collected and dried and treated with boiling alcohol (95 per cent.) and filtered, and allowed to crystallize spontaneously. These crystals were next dissolved in boiling alcohol, and treated with purified ivory black, taking the necessary precaution to treat the ivory black with boiling alcohol to dissolve any strychnia which may have been taken up by it during the process of decolorization. The solutions were filtered and allowed to crystallize ; the crystals were redissolved in boiling alcohol of the previously mentioned strength and allowed to crystallize spontaneously, when they were collected and found to weigh fifteen Troy grains.

As commercial strychnia is generally impure, its chief contamination being brucia, which adheres to it more or less in the processes used for isolating it, the above specimen was tested and found to be perfectly pure.

Brucia, according to the analysis of Pelletier, exists in this

plant, but in a much smaller amount than in the *Nux vomica*, while the strychnia predominates in the *Ignatia amara*. The presence of brucia is readily recognised by nitric acid producing the deep red color, with a decoction of the beans.

Igasuric Acid.—This acid, which is by some chemists called strychnic acid, exists in the beans in combination with strychnia and brucia in the form of an igasurate of these alkaloids. The following process was employed for obtaining it :

A quantity of the contused beans were macerated, and then treated with successive portions of cold water, until their bitterness was completely exhausted. The solutions were then carefully evaporated to the consistence of a syrup, and the gum precipitated by means of alcohol ; this alcoholic solution was filtered and evaporated by the aid of a water bath to the consistence of an extract. This extract, which consisted principally of igasurate of strychnia, was dissolved in cold water, and treated with an excess of the acetate of lead, and the igasurate of that oxide allowed to subside. The precipitate was next washed and placed in water, and decomposed by a current of sulphuretted hydrogen. The solution of igasuric acid was then separated from the sulphuret of lead by filtration ; being still impure, it was digested with ivory black, and again filtered, when it was carefully heated and allowed to crystallize.

From seven hundred and twenty grains of the beans, treated in the manner above described, I obtained eight grains of pure igasuric acid. It crystallizes very rapidly when placed in a warm atmosphere, in long acicular crystals, of a white color, having an acid taste, and an acid reaction, producing with a neutral solution of the sulphate of copper, a beautiful light green precipitate, a characteristic so peculiar to this acid. This acid by an increase of heat is decomposed, being converted into a dark brown substance.

In consequence of the small amount obtained, I was unable to make any further experiments.

Volatile Principle.—By submitting a quantity of the contused beans, after two days maceration to distillation, a clear transparent liquid was obtained, which was devoid of taste, but having a strong odor, very analogous to that of the beans. This upon standing deposited a white flocculent precipitate, and the odor

was gradually dissipated. From the foregoing phenomena, it is natural to suppose that the beans contain a volatile principle (probably an oil) which, when exposed to the air, absorbs oxygen, and in this respect resembling the volatile oils.

Alcoholic Extract.—Several methods have lately been proposed for the preparation of this extract, all amounting to the same thing, the only precaution being to insure a complete exhaustion of the beans, and a careful evaporation.

From thirty-five hundred grains of the beans I obtained three hundred and eighty-eight grains, or about eleven per cent. of extract. The extract is of a dark brown appearance, and has a strong, not unpleasant odor, very analogous to the odor of the distillate mentioned in a previous article. This extract is very powerful; half a grain dissolved in a drachm of alcohol, proved fatal to a small cat in the space of three or four minutes, with all the symptoms of poisoning by strychnia.

Is starch present in the beans?—According to the analysis of Pelletier and Caventou starch is said by them to be a constituent of the beans. For the purpose of corroborating this statement, a decoction was prepared by boiling half an ounce of the contused beans in a pint of water down to half a pint. A portion of this decoction, when cool, was tested with a solution of iodine, but without success.

To be better satisfied, a still more delicate test was employed, viz.: by adding to this decoction a few drops of nitric acid, and to this a solution of the iodide of potassium; the acid united with the potassium to form nitrate of potassa, and thus the iodine was set free, coating the sides of the tube, without producing the deep blue color so characteristic of the presence of starch.

Gum.—The gummy matter obtained by precipitation by alcohol, in the process employed for isolating the strychnia, was carefully collected and dried, and found to weigh three hundred grains. This was very adhesive, and resembled true gum in every particular, devoid of taste, soluble in water, but insoluble in alcohol. A solution of the subacetate of lead added to a solution of the gum, produced a dense precipitate which was redissolved by an excess of acetic acid.

A small amount of fatty matter or fixed oil exists in the beans, soluble in alcohol and ether.

Resin.—A tincture was prepared by macerating a portion of the contused beans, in an equal proportion of alcohol and ether for several days, which upon the addition of water, was rendered slightly milky, and upon being allowed to stand for a few hours deposited a small amount of resin.

Coloring Matter.—Yellow coloring matter is also a constituent of the beans ; it is soluble in alcohol and water, but insoluble in ether.

The decoction of the beans slightly reddens litmus from the presence of igasuric acid.

Tincture of iodine produces a yellowish brown color with the decoction.

Tincture of the sesquichloride of iron produces a greenish coloration with the decoction ; but this does not depend on the presence of tannic acid, for a solution of gelatine produces no precipitate with the decoction.

Solution of the ammoniacal sulphate of copper produces a beautiful emerald green color both with the infusion and decoction.

Tannic acid added to the decoction of the beans produces a grayish precipitate, which is tannate of strychnia and brucia with coloring matter.

Nitric acid produces with the decoction, first a violet color, which gradually assumes a deep red, and finally changes to a yellow color.

Acetate and sub-acetate of lead cause dense precipitates.

Alcohol also produces a precipitate which is gum.

Ammonia produces a beautiful wine color.

Incineration.—Two hundred grains of the contused beans were incinerated, and yielded twenty-two grains of ashes, in which lime and potassa were detected.

Bassorin.—A small amount of insoluble gum was also detected in the beans.

Albumen.—No albumen could be detected by the requisite tests.

Recapitulation.—From the foregoing experiments the constituents of the beans have been found to be as follows :

Two alkaloids, strychnia and brucia, in combination with igasuric acid, a volatile principle (supposed to be an oil,) a

a large amount of extractive and gummy matter, a small amount of resinous, coloring, and fatty matter, and a trace of bassorin, but no starch or albumen.

ON TINCTURE OF CHLORIDE OF IRON.

By WILLIAM S. THOMPSON.

When prepared in accordance with the U. S. Pharmacopœia, this medicament is liable, from various causes, to vary in strength and other properties. It is true, that if the muriatic acid is always of the officinal specific gravity, and the subcarbonate of iron invariable in its proportions of moisture and carbonic acid, the tincture would be of uniform strength, but still an objectionable preparation, in consequence of its tendency to deposit the protochloride of iron, and thus gradually to become weaker.

The proper strength of the acid is that which has the officinal density, for it dissolves the whole of the subcarbonate, with the exception of a slight residue of impurity. An acid of higher specific gravity would render the tincture unduly acid, while one of lower strength would be too feeble to take up all of the iron. It being often difficult, however, to obtain the acid of the exact specific gravity required, I feel prompted to suggest, from my own actual experience, the following means of making the success of the process, as well as the uniform composition and permanence of the product, entirely independent of the strength of the muriatic acid employed.

The subcarbonate of iron, of the shops, seems to consist of a mixture of the carbonate of the protoxide and sesquioxide of iron and water, in variable proportions, depending in a great measure upon its mode of preparation and the manner of drying it. In the U. S. Pharmacopœia it is directed to be dried with a gentle heat, but neither the degree nor the mode of desiccation—whether in an oven or over a water-bath—is stated. It is the custom with some pharmacutists to dry it in conical-shaped muslin bags, suspended in a current of air at the ordinary temperatures of the atmosphere; and, dried in this manner, it no doubt contains a much larger proportion of moisture and protocarbonate, than when it is dried “with a gentle heat;” by which plan it is sometimes made to nearly resemble the sesquioxide in appearance, and to assume a condition more favorable for preparing the tincture.

I have found from experiment with two samples of subcarbonate of iron made by different manufacturers, that it loses 20 per cent. in weight upon being carefully heated to redness; and the residue is nearly pure, dry sesquioxide. Three drachms of this oxide were mixed with one fluid ounce of muriatic acid of the sp. gr. 1.16, digested at a moderate heat, on a sand bath, filtered, when cold, (through a paper which had been previously weighed,) and washed with three fluid ounces of alcohol. The resulting tincture was of a reddish brown color, without a trace of protochloride, and contains, theoretically, 34 grains of sesquioxide to the fluid ounce; or rather yields that quantity upon precipitation with ammonia. The residue on the filter having been carefully dried was found to weigh 45 grains.

For preparing tincture of the sesquichloride of iron with ordinary muriatic acid, without reference to the strength of the acid employed, I propose the following formula:

Take of Sesquioxide of Iron, prepared from sub-

carbonate, heated to redness, 6 oz. Troy.

“ Muriatic Acid, a sufficient quantity.

“ Alcohol, 3 pints or a sufficient quantity.

The sesquioxide having been placed in a flask or other convenient vessel, one pint of the acid is then added, and the whole left for five or six hours, during which interval it must be occasionally stirred or shaken. It is then gently heated by a sand bath, further additions of acid being made from time to time until all the oxide has been dissolved. When the solution is cool, then add a sufficient quantity of alcohol to make the whole measure four pints, and filter. The filtrate is a clear tincture, which contains, theoretically, 45 grains of sesquioxide to the fluid ounce. This, I believe to be the most simple and effectual plan for preparing tincture of the sesquichloride, so as to insure invariable strength, maximum therapeutic power and insensibility to change.

My *first* experiment in making a tincture of pure sesquichloride of iron was based upon the proportion of sesquioxide obtained from a given quantity of pure crystallized protosulphate, and though forming a more elegant and exact compound, involves much care and labor in the practical details of its preparation. I, however, give the formula, which is as follows:

Take of Pure Crystallized Protosulphate of

Iron,	5¼ oz. troy.
“ Muriatic Acid,	a sufficient quantity.
“ Alcohol, commercial, 95 p. c.,	half a pint.

Convert the protosulphate of iron into sesquioxide, in the manner directed in the U. S. Pharmacopœia; having carefully washed it, allow it to settle for at least 24 hours, then draw off with a syphon as much of the water as possible, place the oxide in a glass or porcelain dish, and gradually add muriatic acid until the whole of the oxide is dissolved. The solution at this stage has a ruby red color. Next apply heat to the dish and continue the addition of acid until the liquid assumes a reddish brown color, care being taken not to add an excess, then evaporate the solution to eight fluid ounces, pour in the alcohol and filter. This tincture is weaker in alcohol than that of the Pharmacopœia, and yields upon precipitation with ammonia, 45 grains of dry sesquioxide to the fluid ounce.

Baltimore, May, 1857.

ON FLUID EXTRACT OF UVA URSI.

BY JOHN M. MAISCH.

A physician desired a liquid preparation of uva ursi which should contain all the active principles of those leaves in a concentrated form. No formula for a fluid extract of uva ursi having as yet been published, I attempted to devise one, and offer the following process, together with the reasons that led to its adoption.

The leaves of uva ursi owe their astringency to tannic and gallic acids; their diuretic properties are principally ascribed to the *ursin* of J. C. C. Hughes, and may partly be due to the salts they contain, which, according to Meissner, consist chiefly of malates and citrates; and their bitterness rests in an extractive matter from which Kawalier separated his *arbutin*. All these substances are soluble in water and alcohol, and are to be obtained in a solution which shall represent the medicinal virtues of the leaves. The crystallized substance, discovered by H. Trommsdorff, (*Archiv d. Pharm.*, lxxx. 273,) to which he has

given the name of *urson*, is insoluble in water, scarcely soluble in ether and alcohol, and without taste or smell; it is probably devoid of any medicinal virtue. From these facts it was inferred that diluted alcohol must be the proper menstruum for exhaustion which would leave behind those comparatively inert substances, gum, resin, fatty matter and chlorophyll. The process I adopted was the following :

Take of Leaves of Uva Ursi,	℥xvi.
“ Alcohol and water, each	a sufficient quantity.
“ Sugar,	℥xij.

Reduce the leaves to a moderately fine powder, pour upon them ten ounces each of alcohol and water previously mixed, and after macerating for 24 hours, displace slowly with a mixture of three parts of water to one of alcohol until the powder is exhausted. Then evaporate to one pint and strain.

Fluid extract of uva ursi thus prepared, is of a syrupy consistence, specific gravity = 1.42, has a reddish brown color, and possesses a strongly astringent and bitter taste; each fluid drachm contains the virtues of sixty grains of the leaves, about an ordinary dose. It was given in a case of chronic catarrh of the bladder with good results, mixed with an equal quantity of fluid extract of buchu, of the strength of half an ounce to the fluid ounce.

Philadelphia, May, 1857.

REMARKS ON THE SO-CALLED IODINE WATER.

North Front street, May 26th, 1857.

PROF. WM. PROCTER, JR.

Dear Sir,—The sample of “iodine water” received from you last week, has since then not changed its composition, being placed in a dark room. The wax stopper is colored brown as far as exposed to the fluid while carrying. To determine the amount of *free* iodine present, I made use both of Dr. F. Mohr’s solution of arsenite of soda and of hyposulphite of soda, in combination with starch.

Three portions of five cubic centimetres each, gave the uniform result of 1 *cub. c.* = 0.0001812 gram. of free iodine = 0.01812

per cent. One fluid ounce = 480 grains, therefore, contains 0.08697 of a grain of free iodine.

To determine the *whole* amount of iodine contained in the liquid, I have applied the method introduced by Bunsen, Dupré and Golfier-Besseyre, founded on the oxidation of iodine-compounds to iodic acid or quinque-chloride of iodine by chlorine. A few drops of chloroform, which assumes a rich rose color from the slightest trace of free iodine, served to indicate the completion of the process. In two portions of 20 *cub. c.* each, I found one *cub. c.* = 0.0013405 gram. of iodine = 0.103405 per cent. *One fluid ounce contains* 0.496344 of a grain. Of the whole amount of iodine present, therefore not one sixth is uncombined, the rest being in the form of hydriodic acid.

Your most obedient,

FRED. F. MAYER.

[NOTE BY THE EDITOR.—It will be observed that the above letter corroborates the statements made in our last number, in reference to the condition of the iodine in the so-called "iodine water." Mr. Mayer having a desire to apply the delicate tests indicated, was furnished with a portion of the liquid. His results show a larger amount of combined iodine than we had anticipated to be present, but the total quantity is very nearly that indicated by us. The difference may be attributed to the wax stopper.]

ON CAPSICUM ANNUUM.

By HORACE B. TAYLOR.

(*An Inaugural Essay.*)

This well known plant, from the extensive use made of its fruit as a condiment, as well as in medicine, has been the subject of frequent experiment, with a view to ascertaining its chemical relations. Pereira gives the result of two analyses by Bucholz and Braconnot, and mentions a third by Maurach, in Raspail's work on Organic Chemistry. Reference is made to an active principle obtained by Whilting, besides which, capsicum has been made the subject of unpublished inaugural dissertations. All the chemists I have consulted speak of the active principle as an oil or soft resin; as far as I have ascertained, no organic crystalline principle has hitherto been isolated, though the interesting botanical relations and powerful stimulating properties of the

plant have led to the suspicion of the existence of such a principle. Professor Procter has also made the observation that the so-called capsin of Bucholz afforded a copious inert precipitate with subacetate of lead, while the remaining liquid on evaporation yielded a powerfully pungent extract. In selecting capsicum for a series of experiments, I have, therefore, confined myself chiefly to the search after a peculiar crystalline principle, and as the sequel will show, not without success. The process by which Bucholz obtained his "acid soft resin" was by digesting an alcoholic extract in ether and evaporating; by this means the essential oil and crystalline principle were obtained together, and were not easily separable. By reversing the application of these menstrua, and separating the associated inert ingredients with subacetate of lead, and then freeing the solution from lead, the true "capsin" was obtained. I shall detail only such of my experiments as resulted favorably, and shall do this as briefly as possible.

Experiment 1st.—Five hundred grains of powdered African capsicum were treated with "concentrated" ether by displacement, and exposed to evaporate spontaneously; eighty-eight grains of oleo-resin were obtained. This process was repeated upon a larger quantity, and the semifluid oleo-resin mixed with the first obtained. This was now digested in alcohol of sp. gr. .809 and filtered; the alcohol solution obtained was now treated with subacetate of lead, which threw down a copious precipitate; this was separated by filtration, and the clear alcoholic solution treated with sulphuretted hydrogen, which separated a large amount of sulphuret of lead. After boiling, again filtering and evaporating, it was set away for a day or two, and was found, when examined, to have solidified into a mass of beautiful crystals. A portion of the mass was nearly white, while the remainder was impregnated with the coloring matter of the fruit. In subsequent testings this was found to contain traces of lead, and farther treatment with sulphuretted hydrogen was resorted to. Owing to the comparative insolubility of this gas in alcoholic liquids the entire separation of the metal as sulphuret was difficult. The crop of crystals obtained after further exposure to the gas and to evaporation was less complete, owing, perhaps, to the first having been thrown down at a very low temperature on one

of the coldest days of the present winter ; it was solid, consisting of tufts of aggregated acicular crystals much matted together, without any supernatant liquid ; the second crop consisted of a few well defined, distinct, acicular crystals, surrounded by an apparently uncrystallizable liquid of a yellowish red color. The crystals were soluble in alcohol, ether, chloroform, oil of turpentine, and caustic potash. Heated on platinum foil they first melt, then take fire, burning with a bright rose-colored flame, and then passing into a dense white vapor, which is very pungent and suffocating. Heated with sulphuric acid they blacken and give off white fumes. Its taste is excessively fiery, inflaming all parts with which it comes in contact. Its odor, though similar to the fruit, is faint.

Experiment 2d.—Two ounces of the same capsicum was treated with alcohol, sp. gr. .835 by displacement, and allowed to evaporate spontaneously ; the amount of extract was 271 grains ; half of this was treated with ether, which left an insoluble residue resembling gum, which was separated, and found to be soluble in water and to precipitate with subacetate of lead. The ethereal solution was evaporated to the consistence of an extract, then dissolved in alcohol, and the alcoholic solution treated with subacetate of lead, as in the foregoing experiment. This threw down a large precipitate which was separated by filtration, the filtrate was treated several times successively with sulphuretted hydrogen, which separated the lead, filtered as before, and allowed to evaporate spontaneously. The resulting semifluid mass was yellow, with the fiery taste of capsicum, and its characteristic odor combined with that of acetic acid. It was apparently quite uncrystallizable, and volatilized in the form of a white vapor, insupportably pungent and irritating. It was found to be soluble in alcohol, and ammonia added to the alcoholic solution failed to throw down a precipitate. It was insoluble in acetic acid, sp. gr. 1.041 ; with caustic potash it formed a solution in which an excess of acetic acid produced a yellowish pulverulent precipitate suspended through it.

Experiment 3d.—A portion of powdered capsicum was digested with water in a tin retort, connected with a suitable receiver ; to this heat was applied and the distillate carefully collected ; it had a pungent taste, with a characteristic, though empyreumatic odor.

On digesting with ether and with chloroform, and evaporating, a pungent, colorless, essential oil was left, though in small quantity. No trace of a crystalline principle was obtained by this process.

Summary.—From the experiments thus obtained, it may be inferred, that the active principles of capsicum are: 1st. A peculiar crystallizable principle, the true *capsicin*. 2d. An essential oil, besides which wax was obtained as a residuary product of experiment first; and a peculiar gum soluble in alcohol and water, and precipitable by subacetate of lead, as a residuum in experiment second; also, fixed oil, which separated from the evaporated ethereal tincture.

ON A NEW PROCESS FOR MAKING LIQUOR FERRI NITRATIS.

By WILLIAM PROCTER, JR.

About five years ago, (see vol. 23d, page 312 of this Journal,) I suggested a modification of the officinal formula for making solution of sesqui-nitrate of iron, which was afterwards adopted in the second edition of the Pharmacopœia of 1851. This modification consisted in the *gradual* addition of the iron to the nitric acid diluted, so as to insure its full per oxidation; and afterwards, to convert any *sub*-nitrate present into *ter*-nitrate, the solution was heated, and NO^5 dropped in, until the proper color of the solution was attained. Now, in this process so much depends on the strength of the nitric acid, and on the last additions of that acid, that in some hands it has failed to prove satisfactory. Even where a permanent solution has resulted, the color varied from a bright sherry-wine color to that of a full reddish-brown. The cause of the deposit, which occurs in the officinal solution as formerly made, is a deficiency of nitric acid; owing to this deficiency, the solution contains both nitrate of the protoxide and sub-nitrate of the sesqui-oxide; a portion of this sub-nitrate is deposited with a portion of sub-nitrate resulting from the action of the air on the proto-nitrate with the formation of ter-sesquinitrate and sub-sesquinitrate. The color of the solution deepens in proportion to the amount of sub-nitrate

formed, and when its color is blackish brown it is due to the presence of a portion of proto-nitrate in addition. In the following process, which is based on that for making the officinal solution of sesquisulphate of iron, (used in preparing hydrated sesqui-oxide,) a nitrate of the protoxide of iron is first made, and then as much nitric acid added to the solution as will convert the protoxide into sesqui-oxide of iron, and this into ter-nitrate. It is as follows:

Take of Iron wire, (card teeth or small

“ nails,)	three ounces, Troy.
“ Nitric Acid, (sp. gr. 1.42,)	five fluid ounces.
“ Water,	a sufficient quantity.

Mix three fluid ounces of the nitric acid with half a pint of water, and add it gradually in small portions at a time to the iron previously mixed with a pint of water, observing to moderate the reaction by setting the vessel in cold water. In this way the iron is protoxidized at the expense of the water, and hydrogen is evolved without the development of red fumes, which, when they occur, indicate a decomposition of a part of the nitric acid. When all the acid has been added, the solution should be repeatedly agitated with the excess of iron, until on filtering a portion it has a light green color, and with ammonia affords a greenish white precipitate. It is now filtered into a half gallon flask, and the remainder (f. 3ij.) of the nitric acid added, which converts it, with violent effervescence and the escape of red nitrous vapors, into ter-nitrate of sesqui-oxide of iron. The liquid should now be gently heated to deprive it of the absorbed gas, diluted until it measures three pints, and filtered through paper.

Thus prepared, “solution of nitrate of iron” has a pale straw color, a density of 1.098, strong astringent acid taste, affords pure sesqui-oxide on the addition of ammonia, and will keep without any tendency to change. Its appearance is uniform, and in all respects it is a more reliable preparation than the variable one made by the formula of Kerr. It has been used satisfactorily at the Pennsylvania Hospital during the last two months, and possesses the valuable properties appropriate to the officinal solution when well made.

June, 1857.

ON LAPIS CALAMINARIS.

By FERRIS BRINGHURST, Wilmington, Del.

(Extract from an Inaugural Thesis.)

In going through a course of qualitative analysis last winter, I examined a specimen of calamine obtained from a wholesale druggist of this city, and was surprised at the large amount of sulphate of baryta it contained, and the small yield of zinc, of which I found but a mere trace. This induced me to make an investigation of the matter, the result of which is given in this paper.

In the U. S. Dispensatory, mention is made of the experiments of Mr. Brett, who, some years ago, examined the calamine of the English shops, and found it to contain from 78 to 87.5 per cent. of sulphate of baryta.

According to the Pharmacopœia, calamine is an impure carbonate of zinc, but the results of my experiments have satisfied me that zinc, where it does exist, is in very small proportion, and that a large portion of the lapis calaminaris of our shops, does not contain even a trace of zinc.

* * * * *

Analyses.—The following analyses were made in the laboratory of Dr. F. A. Genth, to whom the author is much indebted for his knowledge of chemistry, obtained there during the past two winters.

The last three analyses, though not so complete as the first three, are sufficiently so to answer the object of the investigation.

No. 1, was a sample of calamine from a retail druggist in this city. Its color was a light shade of peach-blossom. Before the blowpipe on charcoal it gave a faint yellow incrustation, and the fused mass, when moistened, blackened silver, evincing the presence of sulphur.

Specific gravity 3.88.

	Pr. ct.
Loss by ignition, . . . . .	.50
Sesquioxide of Iron, Fe ₂ O ₃	1.50
Lime, CaO	2.76
Baryta, BaO	51.55
Oxide of Lead, PbO	a trace
Silica, SiO ₃	16.50
Carbonic Acid, CO ₂	a trace
Sulphuric Acid, SO ₃	26.95

99.76

No. 2, was a specimen from the cabinet of the Philadelphia College of Pharmacy, and the only one of the six specimens examined that contained zinc. It was of a very light brown color, and before the blowpipe gave a yellow incrustation, with a white edge, indicating the presence of lead and zinc.

Specific gravity about 3.9536.

		Pr. ct.
Loss by ignition, . . . . .		.50
Sesquioxide of Iron,	Fe_2O_3	1.20
Oxide of Lead,	PbO	2.21
Oxide of Zinc,	ZnO	2.00
Lime,	CaO	2.26
Baryta,	BaO	45.07
Silica,	SiO_3	18.00
Sulphuric Acid,	SO_3	28.57
Carbonic Acid,	CO_2	a trace
		<hr/>
		99.81

No. 3, a sample from a wholesale druggist of this city, was of a light brown color with a pinkish tint. Before the blowpipe it gave no incrustation, and the mass blackened silver.

Specific gravity about 3.7615.

		Pr. ct.
Loss by ignition, . . . . .		.00
Sesquioxide of Iron,	Fe_2O_3	1.50
Oxide of Lead,	PbO	a trace
Lime,	CaO	1.40
Baryta,	BaO	62.05
Sulphuric Acid,	SO_3	34.16
Silica,	SiO_3	1.00
Carbonic Acid,	CO_2	a trace
		<hr/>
		100.11

No. 4, was obtained from a wholesale druggist of this city. Before the blowpipe it gave no incrustation. Mass blackened silver.

Analysis.—Matter insoluble by long digestion, and subsequent boiling in hydro-chloric acid, consisting chiefly of

		Pr. ct.
Sulphate of Baryta,		95.00
Oxide of Lead,	PbO	a trace
Sesquioxide of Iron,	Fe_2O_3	2.00
Carbonate of Lime,	CaO, CO_2	2.40
		<hr/>
		99.50

No. 5, was obtained of a New York importer about fifteen years ago, by a wholesale druggist of this city.

Mat. insoluble in HCl chiefly	.	BaO SO ₃	48.50
Sesquioxide of Iron,	.	Fe ₂ O ₃	2.00
Carbonate of Lime,	.	CaO CO ₂	49.00
			<hr/>
			99.50

No. 6 from a retail druggist of this city, was of a light salmon color. Before the blowpipe it gave a yellow incrustation, and the moistened mass blackened silver.

Portion insoluble in HCl chiefly	.	BaO SO ₃	95.00
Sesquioxide of Iron,	.	Fe ₂ O ₃	2.25
Oxide of Lead,	.	PbO	1.00
Carbonate of Lime,	.	CaO CO ₂	1.50
			<hr/>
			99.75

Conclusion.—This investigation I consider sufficiently extensive to show that much of the Lapis calaminaris of our shops is a worthless and inactive article, not only from the absence of carbonate of zinc, to which it owes, or ought to owe, its value as a remedial agent, but also from the presence of so large a percentage of sulphate of baryta, a totally insoluble and inert salt. In the last revision of our Pharmacopœia, the revisors, in substituting the present Ceratum Zinci Carbonatis for the old Turner's Cerate, (now Ceratum Calaminæ) might very properly have gone a step farther and wholly expunged the latter preparation, for it must be apparent that it has little or no other effect than simple cerate, and is consequently a superfluous article in our officinal standard.

Philadelphia, Feb. 20th 1857.

GLEANINGS—CHEMICAL, PHARMACEUTICAL AND MEDICAL.

Preparation of Ferris Pulvis.—Hr. Zängerle suggests that this article can be made by igniting 5 parts of protoxide of iron, 6 parts of anhydrous ferrocyanide of potassium, and $1\frac{3}{4}$ parts of anhydrous carbonate of potassa; the ignition is maintained until the evolution of gas ceases. The fused mass, on cooling, is thoroughly washed with pure water, and the residue dried. The product is a dark gray powder, which is metallic iron in a state

so finely divided as to burn throughout when any part is touched with a lighted match.—*Pharm. Jour.*, May, 1857.

Preparation of pure grape sugar.—Commercial honey, as crystalline as possible, is spread on porous tiles. The white crystalline residue is dissolved in alcohol and purified by recrystallization; if necessary, also with animal charcoal. The honey yields about one-fourth of its weight of grape sugar.—*Chem. Gaz.*, March 2d, 1857.

Lactic acid in the vegetable kingdom.—Prof. Wittstein announces (to the meeting of German Naturalists in Sept., 1856,) the discovery of lactic acid in vegetables, especially in the peduncles of *Solanum dulcamara*, and in the liquid which dropped from freshly cut vine branches. He likewise mentioned that he had obtained salicylous acid (oil of *Spiræa ulmaria*,) by distilling the buds of *Populus balsamifera*.—*Chem. Gaz.*, Mar. 2d, 1857.

Preparation of Alizarine ink.—Hr. Leonhardi, of Hanover, has patented a process for making this ink. 24 parts of Aleppo galls and 3 parts of Dutch madder are digested with 120 parts of warm water. The solution formed is filtered, and mixed with 1.2 parts of solution of indigo, 5.2 parts sulphate of iron, and 2 parts crude acetate of iron solution. The alleged advantages of this ink are, that 1st. It does not contain gum. 2d. The tannate of iron is prevented from separating by the sulphate of indigo. 3d. Mouldiness is prevented by this addition, and by the acetate of iron.—*Pharm. Jour.*, Jan., 1857.

Coloring principle of garden Bergamot flowers.—M. Belhome states that the flowers of *Monarda didyma* contain the same coloring principle as the fruit of the nopal and cochineal, and that they may be used with advantage for the preparation of carmine.—*Pharm. Jour.*, March, 1857.

Preparation of matches.—Prof. Wagner states that phosphorus matches should not have more than one-tenth of phosphorus, and considers that too large a proportion is often used. The following proportions are recommended, viz.: 8 parts of phosphorus dissolved in bisulphuret of carbon, 21 parts of gelatin, 24 parts of peroxide of lead, and 24 parts of nitre. He considers that the binoxide of manganese would be the best adapted to the preparation of the paste, since it contains a larger amount of oxygen than red lead or peroxide of lead, and as the metallic oxide serves only

to maintain combustion by yielding oxygen. The nitre also is supposed to be serviceable only as a source of oxygen, and might, therefore, be replaced by some other nitrate, for instance nitrate of baryta, which, like the potash salt, is anhydrous.

The amorphous phosphorus does not seem to be nearly so good for the preparation of matches as ordinary phosphorus, most likely in consequence of the necessity for its re-conversion into ordinary phosphorus before ignition takes place.—*Pharm. Jour.*, Feb., 1857.

Fluorine in the blood.—M. J. Nickles has not only found this element in human blood, but likewise in that of other mammalia, as the pig, sheep, ox and dog, and in that of many birds, as turkeys, geese, ducks and chickens. These results give fluorine an importance, not hitherto accorded to it, in physiology, and disprove the opinion of Berzelius that the presence of fluorine in bones is accidental and unnecessary.

To yet further prove the reality of this element being a normal constituent of the animal body, M. Nickles has found it in the bile, in the albumen of egg, in gelatin, in saliva, in urine, in the hair, and in fact, in the entire organism.—*Comptes Rendus*.

Oil of peppermint.—According to the Druggist's Circular, (April, 1857, page 35,) oil of peppermint was manufactured in St. Joseph's County, Michigan, in the year 1855, to the extent of 25,000 pounds, valued in New York at three dollars per pound. From 8 to 12 pounds is the product of an acre. The first crop requires a good deal of care, but the two following years the plant requires but little attention. The mint is cut and distilled in August. If this statement is correct, between two and three thousand acres are devoted to peppermint. According to Mr. Bell, (*Pharm. Jour.*, Jan., 1851,) an acre of peppermint at Mitcham produces on the average five tons of the green cut herb, which by distillation affords $3\frac{1}{2}$ lb. of oil per ton, making $17\frac{1}{2}$ lb. per acre, a larger yield than that obtained in Michigan.

Oil of turpentine as a cure for itch.—Dr. Anselmier (*Jour. de Chim. Med.*, Dec., 1856,) says that of the various methods of treating itch none has been more successful or cheaper than that by essence of turpentine. The following is the mode of using: The patient, on going to bed, sprinkles on the sheets, and his

usual daily clothes, about 50 grammes (14 fluid drachms) of oil of turpentine; when he awakes he is cured; his bed and his clothes are no longer infected. The odor of the turpentine passes off in two or three days.

This treatment has several advantages; 1st, it attacks the parasites at the time they are most accessible; 2d, fumigation acting by substitution on secondary eruptions is much less irritating than lotions and frictions, whether soapy, sulphuretted, or terebinthinated; 3d, the treatment acts at the same time on all the contaminated objects; 4th, not only is it more rapidly efficacious and better than any other, it is likewise the cheapest.—*Chemist*, Jan., 1857.

Glycerin and wood soot in chronic eczema.—M. Bougard, after trying various applications in an aggravated case of chronic eczema, resorted to a mixture of soot and glycerin in equal parts with astonishing effect. Fifteen days' use of this remedy had almost cured the eczema, which was of several years standing. This result was corroborated by subsequent successful treatment of cases of eczema.—*Jour. de Med. de Bruxelles*, Sept., 1856, in *Chemist*.

Glycerin and borax in cracked tongue.—Dr. Brinton says that two samples of borax dissolved in four ounces of water with an ounce of glycerine (Price's) gave marked relief at once, and eventually cured, aided by other treatment, an obstinate case of cracked tongue.—*Lancet in South. Med. and Surg. Jour.*

Poisonous principle of Cyclamen Europæum.—M. De Luca has discovered in this plant a proximate principle which he calls *cyclamin*, and which appears to possess poisonous properties analogous, though in a less degree, to those of the curara of South America. Cyclamin is white, opaque, brittle, inodorous, hygroscopic, and is darkened by exposure to the light. Pigs eat it with impunity, but a drachm of the juice thrown into the trachea of a rabbit caused it to die in convulsions in ten minutes. Bromine appears to possess antidotal powers.

Tinctura Rosæ.—The following formula, attributed to Mr. Squire, is given in the new (1857) edition of Redwood's Supplement to the Pharmacopœia:

Take of rose petals, bruised, 5 ounces; proof spirit, made with rose-water, a pint. Digest for three days, frequently shaking,

and press off. Digest the mass with half a pint of proof spirit for three days, press off, and mix the two liquids to form the tincture for use.

Corn leaves in fever.—Dr. Greenville Dowell, of Texas, states in a letter to the Memphis Recorder, that an infusion of the leaves of Indian corn (*Zea mays*) possesses an anti-periodic power, and is used in febrile diseases in some parts of the South. The Doctor recommends a concentrated tincture given with quinia (!) in minim doses. The tincture is made with half a pound of dried corn leaves to a gallon of alcohol, macerated two weeks and then after filtering reduced to a pint by evaporation. Any anti-periodic requiring the *aid* of quinine deserves not to be relied upon.

Silicate and Benzoate of Soda in gout and rheumatism.—Dr. M. Dowler, of New Orleans, has given a condensed account of a course of medication pursued by Drs. Socquet and Bonjean, of France, (*Jour. de Conn. Med. Chir.*, Oct., 1856) in gout, rheumatism and allied diseases, in which these salts are the chief agents used, and which he calls *dialytic* preparations. Their *Silicate of Soda* is made by infusing one part of pure silica and two of dried carbonate of soda, mixed in powder, in an earthen crucible, and pouring out the silicate on a stone slab to cool. This is then pulverized and treated with boiling water, which only partially dissolves it. The filtered and concentrated liquor allows the salt to be precipitated in an imperfectly crystallized state. This is again dissolved in water at 100° F., filtered and by concentration affords the silicate of soda in the desired state.

Benzoate of Soda is easily prepared by saturating benzoic acid with crystallized carb. soda in hot water, concentrating and crystallizing.

The following is their formula for *dialytic pills*:—

R. Silicate of soda 375 grs.; Hydro-alcoholic extract of Colchicum 240 grs.; Extract of Aconitum napellus one ounce; Benzoate of soda one ounce and a half; medicinal soap one ounce; make into a mass and divide into 1000 pills and dry them well. The dose begins with one daily and increased to three or four daily, one-half in the morning the other at night.

The *dialytic syrup* is made thus:—

R. Silicate of soda 18 oz.; benzoate of soda 9 oz.; syrup of

gum 322 oz. Dissolve the benzoate and silicate separately in a sufficient quantity of hot water, filter and mix the two solutions with the syrup, and then concentrate by boiling. Dose from one to two dessert spoonfuls in a glass of depurative ptisane (infusion of *Dulcamara liquorice*, &c.)

Accompanying these internal remedies an external treatment with liniments is directed, and the following formulæ given for making them :—

Bituminous Dialytic Liniment.—R. Pure naphtha ʒiiss ; narcotic oil ʒss ; volatile oil of turpentine ʒiiss ; mix, agitate occasionally, and after repose filter. The *narcotic oil* above called for is made as follows : Take of dried leaves of belladonna, aconite, tobacco, cicuta, and stramonium of each 3 oz. ; olive oil 156 ounces. Coarsely powder the leaves, moisten with warm water to form a thick paste. After twenty-four hours' contact add the oil, digest the mixture for eight hours with frequent agitation, then press and strain. This oil has a fine green color.

Etherated Dialytic Liniment.—R. Acetic ether ʒiiss ; alcoholic tincture of aconite ʒss ; tincture of arnica root grs. lxxv. ; mix and filter. These liniments are used as frictions, or they may be applied to the part on a compress.

Those wishing to read the medical theory and treatment of the authors will find it in the *New Orleans Medical and Surgical Journal*, and in the *Western Lancet* for June, 1857, page 455.

Vanilla.—Vanilla was imported into the United States last year to the extent of 5,000 pounds, at a cost of \$100,000, which make its wholesale cost \$20 per lb. The duty on this amount, \$20,000, goes into the U. S. Treasury. It seems strange that so valuable a product should not be more extensively produced than it appears to be. Why cannot the vanilla plant, which grows vigorously in our hot-houses, be cultivated in Texas and Florida ?

Dr. Simpson's Morphia Suppositories.—Take of acetate of morphia six grains ; sugar of milk a drachm ; simple cerate half a drachm, or as much as may be sufficient to give proper consistence, and divide the mass into twelve suppositories. Each suppository held on the point of a needle is then dipped into a mixture of one part white wax and two of cerate, previously melted. This should be quickly done, and the melted cerate not too hot.

GLEANINGS.—TOXICOLOGICAL.

Death by Laudanum.—At Stalybridge, Eng., a druggist named John Lees, was brought before a coroner's jury for causing the death of a girl of 15 years old, by selling laudanum for tincture of rhubarb in a *cup without a label*. The jury gave a verdict in accordance with the facts without indicting the druggist.—*Pharm. Journ.* Sept., 1856.

Poisoning by Arsenic with intent to kill.—At the South Lancashire (Eng.) Assizes, Aug. 19, 1856, Jane Newton was tried for administering half an ounce of arsenic to her husband. The arsenic was obtained on the plea of use for vermin. The arsenic was obtained of an apothecary whose assistant testified that "he remembered three females coming in for mercury to kill vermin;" he said, "I supplied them with arsenic—arsenic and mercury are the same—Mr. Waterhouse was there, he received the money. He did not know who it was that came in for arsenic." In answer to the judge he said "a tea-spoonful of arsenic will kill a person." The medical evidence was conclusive as to the arsenic being taken by the husband. The jury rendered a verdict of "not guilty."—*Pharm. Journ.* Sept., 1856.

Poisoning by Antimony.—Betsy McMullen was tried at Liverpool, Aug. 22d, before Justice Willes, for the murder of her husband at Bolton, on the 2d of July last, by repeated small doses of antimony. It appears from the evidence that the husband was in the habit of excessive drinking, and that the wife administered the tartar emetic to him ostensibly for the purpose of correcting this habit. The medical evidence proved beyond doubt that death was caused by that substance. A servant testified to the frequent clandestine administration of a white powder, a part of which she obtained and sent to the family physician. The following testimony of the druggist shows the source of the poison. "*J. Rowland Simpson*, druggist, said he was in the habit of selling emetic powders composed of tartarized antimony and cream of tartar. The powders were sold at one penny each, and he usually cautioned the purchaser to be careful with it, and to divide each powder into four doses. They are called 'quietners.' He did not remember that men ever

purchased them, but they were scarcely ever asked for except by women whose husbands have been on the 'spree,' and are given to cause sickness and to throw up the dregs of the drink." The jury brought in a verdict of *guilty* of manslaughter. The judge before pronouncing sentence cautioned druggists against this practice, and believed that they were equally guilty of manslaughter.

Poisoning by Strychnia.—Jane Dyer came to her death at the General Hospital, St. Heliers, Jersey, on the 30th of August, 1856, from taking four pills containing strychnia, which had been clandestinely taken from the Surgery by an attendant in ignorance of their nature. The poison was detected on *post-mortem* examination.—*Pharm. Journ.*, Oct., 1856.

Poisoning by Black Drop.—On the 11th of Sept., (1856,) Augustus Broughton, son of Colonel Broughton, living near Weymouth, [Eng.] complained of headache, Mrs. Broughton accordingly wrote to Mr. Barling, chemist, as follows: "Please send an aperient draught for a child eleven years of age." Mr. Barling being absent, the note was given to one of his apprentices, John Lundie, aged 20, who told James Barrett, a lad of 13, to fill the bottle with "black draught," instead of which he filled it with "black drop" and gave it to Lundie, who labelled it "black draught" and gave it to Mrs. Broughton's maid. At 9 o'clock the fatal dose was given by the hands of the mother, and the patient became comatose and soon after died. Verdict of the coroner's jury was in accordance with the facts.—*Pharm. Journ.*, Oct., 1856.

[From the evidence, Lundie appears to have been thoroughly qualified and the store in good standing, the mistake having occurred from Lundie's delegating to a beginner what he should have done himself.—ED.]

Poisoning by Sulphuric Acid.—A female child, nine days old, daughter of Thomas and Elizabeth Brennan, of Runcorn, near Liverpool, came to its death by the corrosive action of sulphuric acid (as ascertained by *post-mortem* examination) administered by its parents, who, with a young man resident in the family, were committed on the charge of "wilful murder."—*Pharm. Journ.*, Nov.

Poisoning by Oil of Bitter Almonds.—Two instances of

suicide by taking in each case about half an ounce of oil of bitter almonds have occurred in England. No mitigation of the symptoms resulted from treatment.

Poisoning by Belladonna.—A Frenchman, aged 35 years, took, with suicidal intent, a small lump of Menier's extract of belladonna. In an hour his courage failed, a physician was sent for who found him powerless, pupils dilated, extremities clammy and ice cold, pulse slow and full, face colorless, with indications of great fear. His feet and legs were put in a strong mustard bath, and ten grains of sulphate of zinc given in warm water every minute, until four doses had been taken without effect, when emesis was produced by a teaspoonful of mustard in a tumbler of water. He slowly recovered.—*Pharm. Journ.*

Poisoning by Prussic Acid.—On Thursday, Dec. 30, an inquest was held over the body of Wm. Marcooly, who came to his death suddenly on the 27th by taking what had been sold as castor oil. On investigating the occurrence it appeared that the assistant of Mr. Budd the chemist, was engaged putting up a prescription for a lotion containing a drachm of Scheele's prussic acid at the time the oil was called for, and by some singular aberration the poison was put in the oil instead of the lotion, and thus caused the death of Macrooly. Mr. *Justice Wightman* in summing up said, that to justify a verdict of manslaughter it must be clearly made out that the act was not a mere mistake, such as every one was liable to, but that it was the result of some gross negligence on the part of the accused person. After an hour's absence, the jury returned a verdict of "*not guilty*," with an expression of reprobation of the careless manner in which poisons were generally dispensed.—*Ibid.* March, 1857.

Suicide by Strychnia.—William Gummow, of Newport, (Eng.) sent his servant to a druggist for arsenic to kill rats. The druggist, who gave the messenger three grains of strychnia instead of arsenic, said on his examination, "I have sold the same for killing rats for four or five years to many persons; I write the word poison on my packages and have not a printed label." The deceased took the whole of the strychnia, and despite the medical treatment died after several hours of distressing spasmodic suffering.—*Times*, Feb. 18, 1857.

*Poisoning by the Root of Water Hemlock, (Cicuta virosa).—*Two young men, farm laborers at West Boldon, Sunderland, (Eng.) were engaged in cleaning a hedge and ditch, during which they ate of the root of water hemlock without suspecting its nature, and were found paralyzed and speechless near the ditch. Medical aid was summoned, but they expired shortly after removal to a house. Portions of the root of *Cicuta* were found near with teeth marks on them, and a root in the pocket of one of the laborers.—*Ibid.*

Accidental Poisoning by Arsenic.—On the 16th of March last, the Rev. James Alexander, LL. D., Rector of Tessaurean, Kings county, Ireland, who was just convalescent from illness, sent to the shop of Edward Whitfield, in Ferbane, for a pound of arrow root. Denis Grogan, shopman, finding the shop jar did not contain sufficient, made up the weight from an unlabelled bundle of a white powder. The arrow root was prepared and partaken of by Dr. Alexander, his daughter and two servants. The daughter noticing a peculiar taste in the jelly, at once suspected poison, sent for a physician and immediately administered mustard emetics to her father and herself. Dr. Alexander died on the 1st of April; the others recovered. From the investigation before the magistrates it appears that Whitfield is a grocer, who is in the habit of selling poisons and some medicines used by farmers, and since the accident, rice, jalap, corrosive sublimate and oxalic acid were found in different papers in the same drawer, and all under the care of an ignorant boy. Grogan was required to give bail after a coroner's verdict in accordance with the facts.—*Pharm. Journ.* May, 1857.

Poisoning by Ammonia.—James Thompson, of Halifax, Eng., during a depressed state of mind attempted to drink a wine-glassful of solution of ammonia, but was prevented by a servant. Soon afterwards he stealthily possessed himself of the bottle, which had been locked up, and drank a large draught, from which he expired in fifteen minutes. Verdict accordingly.—*Manchester Guardian and Pharm. Journ.*

Poisoning by Radix Belladonnæ.—Two persons, a father and son, were poisoned at Dudley, England, by taking a decoction of fresh root of belladonna, used accidentally for comfrey ;

after very violent symptoms in the son, involving the eyes and brain, and less marked in the parent, both recovered. About 2 oz. of root was decocted.—*Pharm. Journ.*, May.

Poisoning by Strychnia.—Recovery.—Dr. Hodgetts, of West Bromwich, Canada, describes a case of accidental poisoning by strychnia. A policeman took *four* grains of strychnia, used by him for killing dogs, instead of an opiate powder. He immediately discovered his mistake, ran to a physician and procured an emetic. Dr. Bly arrived in 20 minutes, two other emetics having been given meanwhile without effect. The Doctor found the patient in violent tetanic spasms and his jaws firmly locked, with inability to swallow. Dr. Bly applied chloroform, which relieved the spasms in three minutes and stopped them completely in ten minutes, when a third powerful emetic was given which vomited in ten minutes after. Repeated quantities of warm water were given and thrown off the stomach until all the poison remaining in that organ was removed. The spasmodic symptoms were controlled by the chloroform administered at intervals, until they ceased and the patient was out of danger. The patient retained his consciousness throughout, and in twenty-four hours was pretty well recovered.—*Ibid.*

Poisoning by Sulphate of Potassa.—Elizabeth Gaylor, aged 30 years, died from the effects of a large quantity of sulphate of potassa, purchased by the husband at the wife's request, as he alleges. Dr. Letheby analyzed the contents of the stomach and found sulphate of potassa in it, and from other circumstances and evidence believed deceased had taken an ounce and a half.

The jury returned a verdict of wilful murder against William Gaylor, who was committed.

Poisoning by Opium.—A man named Bury was committed for trial at Worcester, for poisoning three witnesses by mixing opium in the beer with which he treated them. A timely use of emetics saved them from its ill effects.

ON CONHYDRINE, A NEW ALKALOID FROM CONIUM
MACULATUM.

By PROF. T. WERTHEIM.

If the fresh flowers of *Conium maculatum* be extracted with hot water containing sulphuric acid, and the moderately-concentrated extract, after supersaturation with caustic lime or potash, be submitted to as rapid a distillation as possible, a strongly alkaline distillate is obtained, which, besides ammonia and coniine, contains a hitherto undescribed organic base. It is obtained in the pure state in the following way.

The alkaline distillate is neutralized with sulphuric acid, the fluid evaporated on the water-bath to the strongest syrupy consistence, the residue extracted with very highly rectified alcohol, and the alcoholic solution separated by filtration from the deposited sulphate of ammonia. After the alcohol added has been distilled off in the water-bath, the residue is gradually mixed, with continual refrigeration, with a considerable excess of the most concentrated solution of potash; the mixture, when completely cold, is then brought in contact with a sufficient quantity of pure ether, and left so for a long time with frequent agitation; the ethereal solution, which is of a yellowish or brownish-red color, is drawn off from the potash solution beneath it, and the ether distilled off as completely as possible in a glass retort on the water-bath; the remaining fluid is afterwards put into a tubulated retort of smaller dimensions, and the distillation continued on the oil-bath in a current of hydrogen gas, the heat being very gradually increased. In this way oleaginous coniine first distils over, contaminated at the commencement with a little ether and water, but afterwards far purer and perfectly colorless; but when the heat is gradually raised, the retort becomes filled with beautiful, colorless, splendidly-iridescent, crystalline laminae, which appeared in one case at 302° F., in another at 374° F., and in a third only at 410° F. They appear sooner the more slowly the preliminary stage of the distillation is conducted. In the first case this was done very slowly, so that the coniine was evaporated at the lowest possible temperature.

Of course, in this mode of preparation, a considerable contamination with coniine cannot be avoided. But the greater part of

this may be easily got rid of merely by pressing the crystals; for this purpose the sublimed crystalline crust is detached from the neck of the retort, and put into a glass vessel which is immersed in a freezing mixture; by this means the crystals are rendered more compact, whilst at the same time their mass increases, because the coniine passing over with them contains a considerable quantity of the substance in solution; they are then pressed strongly between Swedish filtering-paper, and finally purified completely by repeated recrystallization from ether. The substance thus purified, when completely dried under the air-pump, forms perfectly colorless, nacreous, iridescent, crystalline laminae, of a coniine-like odor. Five Vienna hundredweights = 280 kilograms. of freshly collected flowers, when treated as above described, gave 17 grms. of pure crystals; but even perfectly ripe seeds furnished it in considerable quantity together with the ordinary coniine, and it must be left undecided for the present whether the quantity in the ripe seeds is essentially less than in the fresh flowers. The latter were collected in the immediate vicinity of Pesth and Ofen, and the ripe seeds in the neighborhood of Stuhlweissenburg.

The investigation of this crystallized substance furnished the following facts. It fuses when slightly heated, and may be gradually sublimed even below 212° F. At higher temperatures it volatilizes rapidly and without residue, diffusing to great distances the peculiar odor of coniine, or one very nearly allied to it. It is tolerably soluble in water, and readily soluble in ether and alcohol; the solution has a strong alkaline reaction. Even at the ordinary temperature it expels ammonia from its compounds, but it appears to be separated from its salts by coniine; its aqueous, alcoholic, or ethereal solution, neutralized with muriatic acid, furnished no crystals either by slow or rapid evaporation; but when the alcoholic solution, neutralized with muriatic acid, was mixed with alcoholic solution of perchloride of platinum, taking care that the latter should not be in excess, and this mixture was left first of all *in vacuo* over sulphuric acid, and as soon as crystals began to be formed at the edge, placed to evaporate in the air, remarkably beautiful, large, hyacinth-red crystals were obtained, which were determined by Prof. Peters.

The forms of this platinum-salt belong to the dimetric system; it gave on analysis—

C	27.59	27.34	27.80	16	27.47
H	5.30	5.48	5.16	17	5.15
N	4.55	..	..	1	4.01
Pt	27.95	27.99	28.04	1	28.33
Cl	..	..	..	3	30.47
O	..	..	..	2	4.57

The base which is contained in this platinum-salt consequently has the formula $C^{16} H^{17} NO^2$. Thus we have

Coniine $C^{16} H^{15} N$

New base. $C^{16} H^{15} N, H^2 O^2$.

The latter therefore only differs from coniine by the elements of water, for which reason the author calls the new base *conhydrine*.

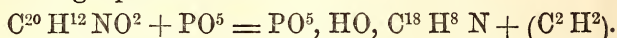
By distillation with anhydrous phosphoric acid, it loses this elementary group of 2 equivs. water, and furnishes coniine, which is exactly similar to the ordinary coniine in all its properties, and even in its action upon the animal organism; whilst conhydrine certainly produces the same phenomena of poisoning, but in a far weaker degree.

The author takes the opportunity of making the following observation upon the muriate of coniine. In the chemical handbooks it is stated that muriate of coniine crystallizes with difficulty, and that the crystals are deliquescent; this, however, is by no means the case; any quantity, however small, of coniine, brought in contact with muriatic acid upon a watch-glass, furnishes a corresponding quantity of crystals in a very short time; these crystals are not in the least deliquescent, and when a rather large quantity is prepared, they are easily obtained very regular in form and of considerable size. The crystals are rhombic, and have the formula $C^{16} H^{15} N, HCl$.

Between coniine and conhydrine we find a connexion which renders it interesting to compare these two bases with quinine and Wittstein's new base cinchonidine.

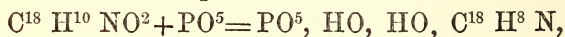
Thus if ordinary quinine = $C^{20} H^{12} NO^2$ be treated with anhydrous phosphoric acid, phosphate of quinoiline and a gas are obtained; the gas is absorbed in small quantity by water, burns with a pale yellow color, and is taken up in very large quantity

by sulphuric acid, in the manner of the gaseous hydrocarbons, which are prepared from the alcohols by the elimination of water. This decomposition may therefore probably be represented by the following equation :—



Wittstein's cinchonidine has the formula $\text{C}^{18}\text{H}^{10}\text{NO}^2$, and is consequently to be regarded as a homologue of ordinary quinine less C^2H^2 .

The result of the action of anhydrous phosphoric acid upon this quinine may, however, almost be predicted with certainty from the above premises ; the reaction will evidently take place in accordance with the equation



and will therefore present the most complete analogy with the similar reaction of conhydrine.—*Chem. Gaz. March 16, 1857, from Sitzungsber. der Akad. der Wiss. zu Wien.*

ON THE RELATIVE ACTIVITY OF THE DRIED CORMUS AND SEED OF COLCHICUM.

By PROF. K. SCHROFF.

Former experiments made by the author, with the fresh bulb and the bruised seeds, did not confirm the general belief of the seeds containing more virtue than the bulb ; he therefore made another series of experiments, but now with the pulverized seed and the dried bulbs, (over two years old ;) also with colchicine, prepared by Mr. Merk, of Darmstadt.

The experiments were made on full grown rabbits, and led the author to the following conclusions :

1. The activity of the seeds is inferior to that of the dried bulbs, dug in the fall.

2. The cormus obtained in the fall, and dried simply by exposure to the sun and air, loses nothing of its activity either by this drying process or by keeping ; the active principles are neither volatilized, destroyed nor decomposed. 130 grains of the dried bulb killed a rabbit on the first day ; while of the fresh bulb, 130 grains on the first, and 170 grains on the second day, were required to kill a rabbit in from two to five days. The fresh

bulb is less active on account of the large amount of water it contains, which is driven off during exsiccation. In all these cases of poisoning, the symptoms before and after death were alike.

3. The dried, as well as the fresh bulb, dug in summer, is much less active than the fall root.

4. The exsiccation by the heat of the sun in the open air, is preferable to any other mode of drying, (slicing transversely, immersing in boiling water, cutting out of the new offset, &c.)

5. Good bulbs are not injured by keeping for several years. Of course, they must have not been eaten by insects or otherwise altered.

6. The symptoms of poisoning by the fresh and dried bulbs being alike with those produced by colchicine, this principle is to be regarded as the really active principle, though up to the present time it has not been prepared yet from the bulb. Pelletier and Caventou discovered, in 1819, gallate of veratria in the cornus of colchicum, but Geiger and Hesse showed, in 1833, that this must be a mistake, as they had discovered in the seeds a principle different from veratria to which they gave the name of colchicine.

As yet, there have been no experiments made for comparing the relative activity of the bulb and seeds. The mistake of the latter being stronger than the former may have originated in the fact that most of the poisoning cases occur with the seeds and their preparations, and that the bulb varies in its activity with the state of its maturity; that during spring and summer, according to the author's former investigations, it contains the active principle in very small proportions, and consequently exhibits little or no toxicating properties.—*Oester. Zeitschr. f. pract. Heilkunde*, 1856, No. 22-24, and *Buchner's N. Repert.* 1856, 437-444.

J. M. M.

ON THE DETECTION OF THE ADULTERATION OF ESSENTIAL OILS, ESPECIALLY WITH OIL OF TURPENTINE.

By G. S. HEPPE.

It is remarkable that well-dried nitroprusside of copper behaves in a very characteristic manner towards oil of turpentine and

some other oils, so that this reagent may serve for the detection of oils free from oxygen, especially oil of turpentine, in those which contain oxygen. Turpentine cannot be detected by this means in oils which are themselves free from oxygen, such as oil of lemons, oil of orange, or oil of juniper.

A fragment of nitroprusside of copper, of the size of a pin's head, is brought in contact with a small quantity of the oil to be tested in a test-tube; it is heated until the oil begins to boil, kept boiling only for a few seconds, and then allowed to settle. If the oil be an oxygenated oil free from turpentine, the nitroprusside of copper becomes black, brown or gray, and the supernatant oil changes its color and usually appears darker. If the oil contains turpentine, the deposit is of a fine green, or bluish-green, and the supernatant oil colorless or slightly yellow.

The above-mentioned conditions must be exactly observed. If necessary the lens must be employed to ascertain the changes of color, for even the color of nitroprusside of copper treated with oil of turpentine is different and more intense than its original color. Sometimes also it is advisable to make experiments with pure oil.

Of the oils free from oxygen the author investigated the following, and found their action the same as above described, even when the boiling was continued longer; it was only in No. 7 *a* and *e* that the oil became darker, but the deposit was of a more intense green.

1. Petroleum, crude and rectified; 2. Oil of bitter oranges; 3. Oil of sweet oranges; 4. Oil of orange flowers; 5. Oil of juniper berries; 6. Oil of savin; and 7. Oil of turpentine: *a*, crude German; *b*, crude French; *c*, rectified French; *d*, German rectified over lime; and *e*, very old, rectified French, which had become thick.

The oils containing oxygen behave similarly in general, but even here small differences occur. Of the oils from the *Umbelliferæ* the author tested,—

1. *Oleum Carui*, prepared from the seeds and from the stalks, pure and mixed with oil of turpentine. The pure oil, when boiled with the reagent, rapidly became turbid; the precipitate was deposited with difficulty; the change of color was more distinct the longer the boiling, and the older the oil. An addition

of oil of turpentine entirely prevented the decomposition, but it must not be boiled too long, as oil of turpentine is more volatile than the other essential oils.

The oil from the stalks, which is of a less agreeable odor, behaved when pure exactly like the oil of the seeds. Nearly all the samples obtained from different manufactories contained oil of turpentine.

2. *Oleum Fœniculi*.—The reagent became first dark green and then black; with a very small quantity of the reagent the oil became brownish-yellow, with a larger quantity reddish-brown. In this case the author believes that 20 to 22 parts of oil decompose 1 part of the reagent. The addition of oil of turpentine prevented the decomposition.

3. *Oleum Anethi*, and 4. *Oleum Anisi semin.* exhibit the reaction very rapidly; weaker when 1 part of the nitroprusside of copper is acted upon by 1000 parts than by 100 parts of the oil: the deposit is black.

5. *Oleum Cumini semin.* became brownish-yellow with the first, and dark yellowish-brown with the second proportion: the deposit was only ashy-grey.

Of the oils of the *Labiatae*, the author examined,—

6. *Oleum Lavandulæ*.—It furnished a slate-grey deposit. The color of the oil became darker according to the quantity of the reagent.

Also 7. *Oleum Menthæ pip.*; 8. *Oleum Menthæ crisp.*; 9. *Oleum Melissæ*; 10. *Oleum Majoranæ*; 11. *Oleum Salviæ*; 12. *Oleum Serpylli*. They behaved in general like *Oleum lavandulæ*. With some the deposit was quite black; with others brown or greyish-black. An addition of oil of turpentine prevented the change of color.

Of the oils of the *Compositæ*, there were tested,—

13. *Oleum Absinthii*; 14. *Oleum Cynæ*; 15. *Oleum Millefolii flor.*; and 16. *Oleum Tanaceti*. With these the deposit was rather brownish-black, and only pure black with *Oleum Cynæ*. The beautiful blue color of the *Oleum Absinthii* became first pale blue, and then dark green.

The author also examined the following oils from the *Myrtaceæ*:—

17. *Oleum Cajeputi*, the green color of which became brownish-yellow; the deposit was black.

18. *Oleum Caryophyllorum*.—The crude and rectified oils were boiled with the reagent; the color of the oil became violet and cherry-red, and the deposit was slate-grey. Even $\frac{1}{2000}$ of the reagent produced a rose color. Oil of turpentine also prevents the action, when it is not entirely driven off by too strong a heat.

From the *Laurineæ*, 19. *Oleum Cassiæ* and 20. *Oleum Sassafras*, were treated in the same way: in both the reagent became black, the color of the oil was rendered darker; the reagent became opaque, and the oil separated into two strata.

21. The *Oleum Anisi stellati* of the family *Magnoliaceæ* also gave a black precipitate: 22. *Oleum Valerianæ* (*Valerianaceæ*) behaved in the same way. Of the *Rutaceæ* only 23, the *Oleum Rutæ graveol.* was tested; the deposit was ash-grey; the oil was pale yellow and became brownish-yellow.

24. *Oleum Bergamottæ*, of the family *Hesperideæ*, when pure gave an ashy-grey deposit and acquired a darker color. The addition of oil of lemons entirely prevented the reaction.

Of the *Monocotyledones*, only 25, the *Oleum Calami radidis* was tested: it furnished a slate-grey or black deposit, and became dark reddish-brown.

Oleum Sinapis and *Oleum Amygdalarum amar.*, of which the author thinks it questionable whether they are to be reckoned among the essential oils, behave towards the reagent in the same way as the oils free from oxygen; the color of the nitroprusside of copper becomes a beautiful dark green.

The chemical nature of the changes produced by this reagent could not be ascertained with certainty.—*Chem. Gaz. April 15, 1857, from Zeitch. für Pharm. 1855, and Archiv der Pharm.*

NOTE ON SOLANINE, AND ITS DERIVATIONS.

By M. A. MOITESSIER.

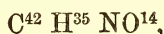
The divergence of the results obtained by the different chemists who have made analyses of solanine has led us to resume the study of this alkaloïd, and to give here the result of an investiga-

tion which we made at the Faculty of Sciences of Montpellier in the laboratory of Professor Chancel.

Several species of the genus *Solanum* (*S. nigrum*, *S. dulcamara*, *S. tuberosum*, &c.,) furnish alkaloids, which are generally considered as identical; we have not yet been able to compare these various substances analytically, but we may affirm that in their physical characters they differ perceptibly from each other, and in the confusion of these various products might exist the cause of the different formulæ, which have been assigned to solanine. Our present paper relates to the alkaloid of the *dulcamara*. The following is the result of several analyses of this substance:—

Carbon . . .	60.73	60.73	60.91
Hydrogen . . .	8.43	8.39	8.69
Nitrogen . . .	"	"	" 3.61

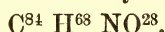
These numbers enable us to establish the following formula:—



which agrees very well with calculation:—

Calculation.		Experiment.
$\text{C}^{42} = 252$	61.0	60.91
$\text{H}^{35} = 35$	8.5	8.69
$\text{N} = 14$	3.4	3.61
$\text{O}^{14} = 112$	27.1	26.79
	<hr/>	<hr/>
	100.0	100.00

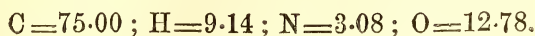
M. Blanchet has arrived at a very different formula:—



According to him, this alkaloid would contain per cent.—

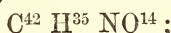
Carbon	62.0
Hydrogen	8.9
Nitrogen	1.6
Oxygen	27.5
	<hr/>
	100.0

M. O. Henry has arrived at the following composition:—

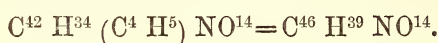


It therefore became interesting to determine the equivalent of solanine, in order to establish its formula. Not having been able to arrive at this result by the analysis of the salts, which are all amorphous and gummy, we deduced it from that of its derivatives.

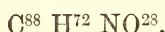
Ethylsolanine is obtained by heating to 120° C. (248° F.) in a sealed tube, an alcoholic solution of solanine and iodide of ethyle, and precipitating by the product of the reaction with ammonia. Representing the formula of solanine by—



that of ethylsolanine would be—



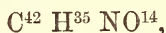
Adopting the formula proposed by M. Blanchet, that of ethylsolanine would be—



The following are the results of the analyses of ethylsolanine, with regard to the theoretical data furnished by our formula, and by that of M. Blanchet:—

	Experiment.	Calculation. ($C^{46} H^{39} NO^{14}$)	Calculation. ($C^{88} H^{72} NO^{28}$)
Carbon . .	62.26	62.58	63.12
Hydrogen . .	8.85	8.8	8.59
Nitrogen . .	"	3.17	1.67
Oxygen . .	"	25.39	26.62

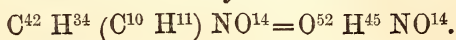
According to these numbers, which agree much better with our formula, we think that—



should be adopted as the formula of the alkaloid of dulcamara.

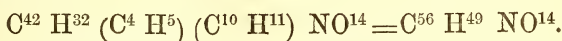
Ethylsolanine is a white substance, amorphous in appearance, but observed with the microscope, it appears to be composed of a mass of tangled crystals. It is without odor, has a bitter taste, is insoluble in water, and soluble in alcohol. All the salts are very soluble and gummy; they are very poisonous, and give rise to the same symptoms as solanine.

Amylsolanine is obtained like the foregoing body, substituting iodide of amyle for iodide of ethyle. Its formula is—



Amylsolanine and its salts greatly resemble ethylsolanine in their physical and chemical properties.

Ethylamylsolanine is obtained by the reaction of iodide of amyle on ethylsolanine, or iodide of ethyle on amylsolanine. Its formula is—



This body greatly resembles the two former in its properties.

It would be interesting to push these substitutions further, and to see whether a third equivalent of hydrogen may be replaced by a radical; but the want of materials compelled us to suspend this work, which we intend to resume, in order to arrive at the constitution of this alkaloid.—*London Chemist*, 1857, from *Comptes Rendus*, Nov. 17th, 1856.

ON THE MEDICINAL USE OF COCONUT OIL.

By MICH. PETTENKOFER.

It is known that vegetable fats are much less apt to become rancid than animal fats, and in consequence of that fact the oleum cocos, cocoanut oil, was several years ago in Munich proposed as a substitute for lard. Since that time it has been used in many preparations and was found to answer for various purposes.

By the animal heat of the skin it easily and perfectly liquefies, and is then most readily absorbed by the human skin. Lard, on the contrary, disappears more slowly, and is therefore to a large extent taken up by the bedclothes and garments to which even with the most scrupulous cleanliness it soon imparts a rancid smell.

Ointments prepared of hog's lard and iodide of potassium, even if the lard was quite fresh, turns yellow after a few days, owing to the elimination of free iodine, and the color becomes deeper every day. But if coconut oil be used in place of lard, the appearance of such ointments does not change at all for the space of two months or even a longer time. So might butter which is still used for eye and other salves, properly be substituted by coconut oil. Ointments like Unguentum Althææ, Linariæ, Sabinæ, Digitalis, &c., keep unaltered for a considerable time when prepared with oleum cocos, but they very soon acquire a rancid

smell when made with lard. By agitation coconut oil is able to take up one third part of water or other liquids more than lard, a property which may become valuable for the admixture of solutions of extracts and salts.

At an ordinary temperature, coconut oil has the consistency of lard, between 5 and 10°C. (40 to 50°F.) it is hard like suet; but at 25 or 30°C. (77 or 86°F.) it is semifluid, while lard does not show so much difference between these temperature. Dr. Buchner proposes the addition of wax in suitable proportions during the hot season and in warmer climates.

The peculiar smell of cocoanut oil, according to Dr. H. v. Fehling, (*Annalen d. Chem. u. Pharm.* 1855, liii. 399,) is due to caprylic and capronic acid, both which volatile acids accompany it in very small quantity. The amount of the first is much greater than that of the latter; caprylic acid, however, has but a faint smell, while that of the capronic acid is much stronger, and to it really the cocoanut oil owes its peculiar perfume.

The white cocoanut oil of commerce usually requires no other treatment to adapt it for medicinal purposes, except to remelt it by a moderate heat and strain it through linen. That which has not the desired whiteness and purity may be melted, digested with coarsely powered charcoal, and afterwards filtered through paper, which may be easily accomplished as it remains liquid for some time even far below its melting point, and therefore in a moderately warm place does not present any difficulty for the filtering process. The digestion with charcoal for several hours also reduces considerably its peculiar smell.—*Buchner's N. Repertorium*, 1856, 485–488.

J. M. M.

ON THE BYTTERIA FEBRIFUGA, AND ITS ACTIVE PRINCIPLE.

By M. GERARDIAS.

For a long time the inhabitants of the Antilles have used, to cure the intermittent fevers to which they are subject, a bitter wood, furnished by a tree which grows in Saint Martin, and which is known in that island by the common name of *bitter ash*.

M. Amic, physician in chief in the island of Martinique, wishing to ascertain the origin of this wood and the proximate principle to which it owes its properties, directed M. Gerardias,

Pharmacien to the Fleet, to isolate this proximate principle. M. Gerardias has obtained the bitter principle of the *bitter ash*, by exhausting the wood by decoction in water, treating the concentrated decoction with sub-acetate of lead, and evaporating the filtered liquid after having separated the excess of lead with sulphuric acid.

The substance which separated towards the close of the evaporation, under the form of crystalline pellicles, was dissolved in alcohol, decolored by animal charcoal, and obtained perfectly white and crystallised.

The average yield was three grammes per kilogramme of wood.

Thus obtained in a state of purity, this substance presents the following characters; it is white, crystalline, inodorous, and excessively bitter.

When slightly heated it melts into a colorless liquid, and on cooling becomes a transparent non-crystalline mass. If the heat is continued, the liquid at last disappears, after diffusing white vapors. When the heat is greater and suddenly applied it gives a brown liquid, diffusing yellow vapors which are not ammoniacal, which condense in small empyreumatic and slightly acid drops, and it leaves a very abundant carbonaceous residue.

It is nearly insoluble in cold water; nevertheless, this liquid retains sufficient to become extremely bitter; it dissolves much better with the aid of heat.

Concentrated sulphuric, nitric and hydrochloric acids dissolve it cold and without coloration; but the addition of water precipitates it immediately.

It dissolves readily without heat in alcohol, and this solution, which is neutral to litmus, is not precipitated by water. This alcoholic solution, diluted with water, is not precipitated with sub-acetate of lead, but is precipitated white by tannin and brown by ioduretted iodide of potassium.

As until then no one knew to what family the *bitter ash* belonged. MM. Chapuis, surgeon of the first class to the fleet, and Belanger, director of the *Jardin des Plantes* of Saint Pierre, were, at the desire of M. Amic, sent to Saint Martin by the Government of Martinique, to study this plant. These gentlemen determined that the *bitter ash* was a plant not hitherto de-

scribed, and should be placed among amyridæ, of the family of terebinthaceæ. M. Belanger gave it the name of *bytteria febrifuga*. M. Gerardias consequently considers that the bitter principle which he has isolated is a new one, and has given it the name of *bytterine*.

M. Belanger has since found the bytteria in Martinique, where it is known by the name of male *simaruba*, whereas the officinal *simaruba* is known there as the female *simaruba*. When M. Gerardias, wished to avail himself of this resource to prepare the bitter principle on a large scale, so as to try its power as a febrifuge, he found that this wood was of three qualities, whose differences he attributes to the conditions of vegetation, and especially to the time of the crop; the first quality, treated by the process indicated, readily yields its bitter principle; the second contains a larger proportion of mucous matters, which the sub-acetate of lead does not separate entirely, but which may be entirely precipitated by adding ammonia to the liquid, which is no longer rendered turbid by the subsalt of lead; the traces of metal which remain in the liquor, after the treatment by ammonia, are precipitated by carbonate of soda; then the bitter principle is separated perfectly by evaporation.

Finally, in the third quality of wood, the author has found very considerable quantities of fecula which, not being precipitated by the reagents already quoted, form a paste with the bitter principle and prevent it from being separated. The best process for the treatment of this quality of wood, appears to be the following.

The concentrated decoction is precipitated by an excess of milk of lime, a little sub-acetate of lead is added before filtering, so as to cause further precipitation, and to facilitate the deposition of that formed by the lime. The decanted liquid is then neutralised with nitric acid, then treated with sub-acetate of lead and ammonia. When all the mucous and extractive matters are eliminated, we have only to separate the last traces of lead by carbonate of soda, which precipitates the lime at the same time, and then to evaporate.

The discovery of a considerable quantity of starch in the wood of the bytteria is worthy of observation; it may become the object of study, and of important practical applications.

M. Gerardias gives the following description of the bytteria, from the samples which he procured in the neighborhood of Fort de France.

The *bytteria febrifuga* is a tree from 15 to 20 metres in height, whose diameter is about 60 centimetres; the bark is a brownish grey, slightly furrowed; the wood is light, white with yellow veins; the leaves are alternate, they are formed of from four to eight pairs of large leaflets, rather unequilateral, almost sessile, lanceolated, and of one terminal petiolated leaflet.

The flowers form a compound corymb, they are of a greenish white, hermaphrodite and complete, the calix has usually four free sepals, the corolla has four open, free petals, four stamens are inserted in a hypogenous disc. In a very few flowers we find five sepals, petals and stamens. The carpels are always two in those flowers having four petals, and in most of them with five, but in some few of the latter we find three. In all cases the carpels are attached to a very developed disc, the ovaries are perfectly free, the styles only are united from their origin, and are only divided towards their extremities, to form as many stigmas as there are ovaries. One carpel in general arrives at maturity, sometimes two may be found, but never three. The fruits are globular and dry. The seeds have no endosperm.

According to these characters, M. Gerardias thinks the bytteria should be reckoned as approaching the tribe of simarubas of the family of rutaceæ; that if, notwithstanding the characters which distinguish it from them, we do not form a new group for this plant, and still unite it to the simarubas, it should at least form a distinct genus.

M. Gerardias says, that the bytteria cannot be the same tree as the quassia of Jamaica; this latter indeed (the *simaruba excelsa* of Candolle, *pierasma* of Lindley, and Endlicher, *Jamaica quassia* of M. Guibourt,) is always described as a plant with polygamous flowers and bivalve fruits, whereas in the bytteria the fruits are always hermaphrodite and the fruit indehiscent. The fruits show no trace of separation, and if we press them hard when ripe, they break irregularly, which never occurs with other simarubas.

Finding that the bytteria so nearly approached the simarubas, M. Gerardias wished to ascertain whether bytterine were not

identical with the quassit removed from the *quassia amara* by Wiggers, and which appears to belong to all this tribe. He has found many points of resemblance between the characters given for quassit, and those which he found in bytterine.

To ascertain the identity of these two substances, he tried to obtain quassit by operating on the *quassia amara*. Having at first tried the same processes as with the bytteria, he obtained nothing, and he was obliged to use the process mentioned by Wiggers, and which requires large quantities of pure spirit and ether. With this process he obtained a small quantity of quassit, and he found that the yield of quassia was much less than that of the bytteria. The result of the comparative examination of these two bitter principles of the quassia and bytteria is that they are identical.

M. Gerardias thinks, that the bytteria being richer in quassit than the quassia amara, and moreover being commoner and growing larger, it would be the best source from which to obtain this bitter principle, and according to the nature of the wood on which we have to operate, and using the processes which he has described, that we might obtain very large quantities of quassit or of bytterine, at such low prices that the kilogramme would not exceed 250 to 300 francs. Quassit, which has hitherto been but little known and unused, because of its small quantity and high price, might take its place in therapeutics, especially if it realises the hopes raised by M. Amic's very interesting results, as a means of cure for intermittent fevers. This would be a great acquisition.

Even supposing that these hopes are not all realised, we cannot imagine that a principle with such powerful properties should not be capable of practical usefulness.—*London Chemist*, April 1857, from *Journal de Pharmacie et de Chimie*, February, 1857.

ON THE PREPARATION OF GALLIC ACID.

By F. STEER.

The author's process is essentially a combination of the modes of preparation long since described by Scheele and Braconnot. 100 pounds of the best black Turkey galls are pounded as fine

as possible, stirred up with water into a thin paste, and left standing for ten days, during which it is frequently stirred, and mixed with fresh water to replace that which is absorbed. Towards the end so much water is added that after it has quietly settled there may be three inches of it at the top; the supernatant fluid is decanted and preserved.

The paste which remains is put into a wooden vessel, adapted for extraction by displacement by water; everything soluble is then extracted.

The whole of the extracts are poured together, allowed to settle completely, decanted and strained into large stone-ware dishes, which are placed in winter in the neighborhood of a warm chamber stove, but in summer in the open air, lightly covered. They are left standing until all the gallic acid has separated, for which purpose from three to four months are required. The mother-liquors are poured off, and the yellowish-red gallic acid, which crystallizes in transparent cubes, is washed several times with distilled water and dried. From the above quantity 24 pounds of gallic acid are usually obtained.

Before this acid is bleached, it must first of all be freed from the flocculent resinous matters, which would otherwise stop up the filter. The acid is dissolved in boiling distilled water, allowed to settle whilst warm, and decanted into another glass flask; pure animal charcoal is then added to it, it is again heated and filtered whilst hot through white filtering paper. The filtrate is heated afresh, poured into the crystallizing dish, which must previously be warmed, and left to stand quietly and well covered for twenty-four hours.

The crystalline cake when taken out must be immediately wrapped up in white filtering paper, as otherwise the moist apices of the crystals are rendered black by ferruginous dust-particles floating in the air; subsequently the black color diffuses itself to the bases of the crystals, which, however, produces a remarkably beautiful appearance.

Although gallic acid is but little employed at present, except in the preparation of pyrogallic acid for photography, it is nevertheless to be expected that it will one day find frequent employment in dyeing.—*Chem. Gaz.*, April 1, 1857, from *Sitzungsber. der Akad. der Wiss. zu Wien*.

ON THE PREPARATION OF PYROGALLIC ACID.

By PROF. LIEBIG.

The author has already called attention to the advantages of the employment of pyrogallic acid in photography; it has since almost entirely taken the place of gallic acid. He now gives a process for its preparation, which he regards as the most advantageous, and which he has employed for the last three years.

The material required is crystallized gallic acid; when decomposed by heat, it furnishes the most beautiful pyrogallic acid in very large quantity. There is no saving in the employment of dried gall-nuts or their dry extract.

For this purpose the gallic acid is strongly dried, mixed with twice its weight of coarsely powdered pumice-stone, and exposed to its temperature of decomposition in a current of carbonic acid. The mixture of gallic acid and pumice-stone is put into a tubulated retort, of which it does not fill more than one-fourth; the retort is placed in a sand-bath, and surrounded with sand nearly up to its tubulure. A glass tube is inserted into the tubulure, through an india-rubber tube, and connected with an apparatus for the evolution of carbonic acid; the tube reaches deeply into the belly of the retort, so that its opening is about $\frac{1}{4}$ inch from the mixture.

The neck of the retort, which must be tolerably wide, reaches about 8 inches beyond the margin of the sand-bath, and is loosely inserted into a corresponding receiver, so that the latter may be easily removed. The object of this arrangement is easily understood. Dry gallic acid is decomposed at a high temperature into pyrogallic acid, metagallic or melanogallic acid, carbonic acid and water; the author has supposed that from 2 atoms of gallic acid, $C^{23} H^{12} O^{20}$, there are formed 2 atoms of pyrogallic acid and 1 atom of metagallic acid, $C^{12} H^4 O^4$, with elimination of 4 atoms of carbonic acid and 2 atoms of water, so that 100 parts of dry gallic acid should furnish 39 parts of pyrogallic acid. But as pyrogallic acid is decomposed into water and metagallic acid nearly at the same temperature at which gallic acid is decomposed, the procuring of 39 per cent. of pyrogallic acid depends essentially on the rapidity with which the acid is removed

from the retort during its formation, and on the vapors being prevented from condensing in the upper part of the retort ; for in this case it is impossible to avoid the fusion of the crystals and the flowing down of the fused pyrogallic acid into the belly of the retort in which it is decomposed. The current of carbonic acid serves to avoid this source of loss, but it also effects another object. In the current of gas the water formed retains its vaporous form at those places in the neck of the retort on which crystals of pyrogallic acid are deposited ; in the receiver, where vapors of pyrogallic acid and water condense simultaneously, a syrupous aqueous solution is obtained instead of the crystals ; from this, pyrogallic acid may be produced by evaporation, although never colorless.

It would be most advantageous to heat the gallic acid in a bath of *constant* temperature ; this can never be attained by a sand-bath placed over a furnace, and the current of gas must therefore be regulated according to the temperature. Thus if drops of fused pyrogallic acid are deposited in the upper part of the retort, the heat must be increased and the current of gas slackened.

When the decomposition is going on, the wide neck of the retort becomes filled very rapidly with long, broad, flat, shining, white needles, which are removed with a feather. If the neck of the retort reaches the temperature of fusion of pyrogallic acid, it runs together, and solidifies lower down into a solid crust, which is removed with a silver spatula ; during fusion the acid acquires a reddish color, which persists after solidification and cannot be got rid of by charcoal. By this method, 31–32 per cent. of solid crystallized pyrogallic acid are obtained ; the 8–9 per cent. which are lost according to the above calculation, give the carbonic acid evolved the appearance of a white smoke, and probably by a judicious arrangement of the apparatus some portion of it might be recovered.—*Chem. Gaz.*, April 1, 1857, from *Liebig's Annalen*, January 1857.

ON BORON.

By MM. WÖHLER and SAINTE-CLAIRE DEVILLE.

Most of the simple bodies, at least those which have been more completely examined, present themselves under interesting

forms. Boron alone, placed between carbon and silicium, both of which crystallize most perfectly, formed an exception to this rule. Investigations upon this substance, commenced by the authors separately but completed in common, have put an end to this exception, by showing that boron exists in three distinct states, thus presenting the same analogies as silicium to carbon, but in a still more marked degree.*

1. *Crystallized Boron, or Diamond of Boron.*—This substance was obtained in the form of transparent crystals, sometimes of a garnet-red and sometimes of a honey-yellow color, although the color could not be regarded as specific, for, like that of precious stones, it might be due to exceedingly small and variable quantities of foreign matters, especially silicium, carbon, or even amorphous boron. It is therefore to be hoped that crystallized boron may be obtained colorless.

The crystals possess such brilliancy and refractive power as to be only comparable to the diamond. This extreme refractive power is the cause of the metallic aspect of crystals of too large a size to be traversed by light. Probably, if boron should be obtained in large colorless crystals, it would present exactly the aspect of the diamond.

Another very important analogy is its hardness. Boron scratches corundum with the greatest ease, so that a cut sapphire, submitted to the action of the powder of boron, very rapidly lost its angles. A cut diamond, with which the crystals of boron were crushed upon a surface of polished quartz, was slightly attacked at all the points of contact. Boron must therefore be regarded as the hardest of all known bodies, or at all events next to the diamond.

The crystalline form of boron has still to be ascertained. The authors have frequently obtained pretty large crystals of boron; but on closely examining these, they proved to be very complicated macles, produced by the regular aggregation of a great number of very small elementary crystals. From their behaviour towards polarized light, the crystals do not appear to belong to the regular system.

* The boron analogous to ordinary carbon was discovered by Gay-Lussac and Thenard, by the reaction of potassium upon boracic acid.

Pulverulent boron, which it is almost impossible to obtain pure by the process of Berzelius, was fused by M. Despretz with the pile. With the heat of the oxhydrogen flame, no perceptible fusion took place with crystallized boron. Crystallized boron, when strongly heated, resists the action of oxygen; it becomes oxidized at the temperature at which the diamond burns, but a little stratum of boracic acid, which forms upon its surface and is easily seen, prevents the extension of the action.

Chlorine, on the contrary, acts with remarkable energy upon boron, which becomes red-hot in an atmosphere of this gas, and is converted into gaseous chloride of boron; it is difficult to get chlorine sufficiently dry to avoid the production of a little vapor in this experiment, and a little boracic acid is deposited, arising from the water and air contained in the chlorine. Crystallized boron burns without residue; the apparent inflation of the crystals, characteristic of the combustion of the diamond in oxygen, is also manifested.

When heated with the blowpipe between two plates of platinum, it immediately causes the fusion of the metal in consequence of the formation of a boride.* No acids, whether pure or mixed, have any action upon boron, either cold or hot; at a red heat bisulphate of potash converts it into boracic acid, with evolution of sulphurous acid.

Boiling concentrated caustic soda does not change it; but monohydrated soda and carbonate of soda dissolves it slowly at a red heat. Nitrate of potash does not appear to act upon crystallized boron at this temperature; it is therefore the most unalterable of all simple bodies.

It is prepared by fusing together in a charcoal crucible 80 grms. of aluminium in large fragments, and 100 grms. of fragments of fused boracic acid. The charcoal crucible is luted into a good black-lead crucible, and the whole put into a blast-furnace capable of easily fusing pure nickel. The temperature is kept at its maximum for about five hours, care being taken to clear the bars of all ashes. When cold, the crucible is broken, and two distinct strata are found in it,—one vitreous, composed of

* Very curious alloys of boron with platinum and palladium have been obtained.

boracic acid and alumina, and the other metallic and cavernous, of an iron-gray color, beset with little crystals of boron; it is aluminium, impregnated throughout with crystallized boron. All the metallic portion is treated with a moderately concentrated boiling solution of soda, which dissolves the aluminium; then with boiling muriatic acid, which removes the iron; and lastly, with a mixture of hydrofluoric and nitric acids, to extract the traces of silicium, which the soda may have left mixed with the boron. The boron is not pure, however; it contains laminæ of aluminium, which may be extracted mechanically, but cannot be separated from the boron by any chemical process.

The vitreous matter, when boiled with water, gives a large quantity of boracic acid and a gelatinous matter, which, is nearly pure alumina. The spontaneous separation of alumina from boracic acid is in accordance with Rose's observations on the action of water upon the borates with insoluble bases.

2. *Graphitoid Boron*.—Aluminium dissolves but little boron. Thus it is usually obtained only in small quantity in this new form, when an alloy of boron and aluminium is dissolved in the way already described for the preparation of graphitoid silicium. A little is obtained in the preceding experiment, and it is easily separated from the crystallized boron from the facility with which it may be suspended in water. Graphitoid boron may also be easily produced by treating fluoborate of potash with aluminium, and adding as a flux a mixture of equal equivalents of the chlorides of potassium and sodium. Small ingots of boride of aluminium are obtained, and these, when dissolved in muriatic acid, deposit the boron in its second modification. This consists of spangles, which are often hexagonal; they are slightly reddish, and have exactly the form and brilliancy of natural graphite and graphitoid silicium. It is completely opake.

3. *Amorphous Boron, or Boron of Gay-Lussac and Thenard*.—This is also produced in the experiment which yields crystallized boron; it is sufficient for this purpose that a small globule of aluminium should be in contact with a great mass of boracic acid. The reaction then takes place rapidly; the aluminium cannot dissolve the boron as fast as it is separated, and after the action of soda and acids a bright chocolate-brown substance is obtained, having all the properties assigned by Gay-Lussac,

Thenard, and Berzelius to the amorphous boron with which they were acquainted.

When amorphous boron is collected on a filter, all that remains adhering to the latter when well dried, burns with remarkable facility and brilliancy when the paper is set on fire. Graphitoid boron, on the contrary, resists the heat produced by the combustion of paper.

From these facts it appears that boron should be placed still nearer than silicium to carbon.—*Chem. Gaz.*, May, 1857, from *Comptes Rendus*, Dec. 8, 1856.

NOTE ON THE ANOMALIES PRESENTED BY ALUMINIUM.

By C. TISSIER.

Relation between the Density and Alterability.—Hitherto the least oxidizable metals have been amongst the heaviest, such as mercury, silver, gold, and platinum; nevertheless, aluminium, the density of which is only 2.56, is the least alterable of all the ordinary metals, after silver, gold, and platinum.

Relation between the Atomic Weight and the Alterability.—In general the metals are more alterable the lower their atomic weight; nevertheless, the atom of aluminium, the alterability of which is so small, only weighs 14; that is to say, it has the lowest atomic weight of all the ordinary metals. It is the half of that of iron, which is 28.

Relation between the Density and the Physical Properties of Metals.—We do not know of any other body of so little density, which possesses like aluminium, the hardness, malleability, tenacity, conductivity, and sonorousness characteristic of what is called a metal.

Aluminium and Thenard's Classification.—According to Sainte-Claire Deville, aluminium does not decompose water;* it should therefore be ranged at least in the fourth section, according to Thenard's classification, and yet its oxide (alumina) is not reducible by hydrogen and carbon, or even by sodium or potassium.

* We admit that it absorbs oxygen from the air at a very high temperature.

Aluminium does not decompose water, and it decomposes carbonic acid and silicic acid exactly in the same way as potassium or sodium.

What rank must be assigned to Aluminium?—This metal ranks not far from silver in its action upon water and oxygen; near the alkaline metals in its action upon silicic, boracic and carbonic acids, and near iron in its action upon the metallic oxides; in fact, it decomposes all the oxides which are decomposed by iron, except the oxide of zinc. According to this last peculiarity, aluminium would have less affinity for oxygen than iron, and would range beside iron, but below it.

In considering what place aluminium should occupy in the electro-chemical series, we find that it precipitates all the metals from their chlorides up to lead and cadmium inclusive,* so that it comes between cadmium and iron.

To sum up, until chemistry has made further progress, we must not hope to assign aluminium an *exact* place in the classifications. However, as M. Sainte-Claire Deville has said, it will certainly be least out of place by the side of iron. We know, in fact, that at a high temperature iron also decomposes silicic, boracic and carbonic acids; and if aluminium has not the same action upon oxygen and water as iron, it is, as M. Deville has also observed, because we do not know an oxide of aluminium of the formula $R^3 O^4$, an oxide which iron always tends to produce at a high temperature.

Lastly, taking into consideration the electro-chemical properties, it is still in the neighborhood of iron that aluminium would be placed.

The remarkable properties which distinguish this metal from all others are therefore—

1. Its slight density.
2. Its resistance to the action of the oxyacids and sulphuretted compounds, which approximates it to gold and platinum.
3. The difficulty with which it enters into alloys, a property which is not shared by the other malleable metals; for iron, zinc, lead, tin, copper, silver, gold, and platinum are capable of form-

* This observation is the result of personal experiments. Aluminium has no action upon the chlorides of iron, zinc, and manganese.

ing more or less malleable alloys, whilst aluminium cannot bear more than 10 per cent. of foreign metal, or enter into combination itself in greater proportion, without greatly modifying the durability of the metal with which it is alloyed.—*Chem. Gaz., March, 1857, from Comptes Rendus, Feb. 16, 1857.*

THE PREPARATIONS OF ARSENIC EMPLOYED IN MEDICINE.

By A. F. HASelden.

In introducing this subject, he said he had nothing new to offer with reference to the medicines he was about to notice, but he thought some benefit might result from a discussion of the relative merits of the different compounds of preparations of arsenic used in medicine, with the view of eliciting the opinions of those present as to which of them ought to be ordered in our Pharmacopœia. At present there were only two preparations of arsenic in the London Pharmacopœia, while there were several others frequently used in medicine, and ordered in other Pharmacopœias. He proposed briefly to describe or refer to the principal arsenical compounds in use, so as to bring the subject fairly before the meeting, and present the points upon which the expression of opinion was desired.

Liquor Potassæ Arsenitis, of the London Pharmacopœia, claimed the first notice, from the fact of its having maintained its position through several generations of Pharmacopœias, and of its being more generally used by English medical practitioners than any other arsenical preparation. By many medical men this was the only preparation of arsenic ever prescribed, but whether this circumstance arose from their considering it superior to all the others, or from their being unwilling to try the effects of any new preparations of so powerful an agent as arsenic, he was unable to say. There appeared to be a difference of opinion as to whether this preparation was rightly called an arsenite of potash or not, some persons contending that the old name of *Liquor Arsenicalis* was a more correct one.

Liquor Arsenici Chloridi had been introduced into the London Pharmacopœia of 1851 for the first time. It was understood to be intended to represent an old preparation, known as De Val-

lenger's mineral solution. It was a solution of $1\frac{1}{2}$ grain of arsenious acid with a little hydrochloric acid in one ounce of water. This and the preceding preparation constituted the only compounds of arsenic ordered in the London Pharmacopœia. Being both in the liquid form, it was to be regretted that they were not of the same strength.

Among the preparations not contained in the Pharmacopœia, there were—

Liquor Sodæ Arseniatis (Pearson's Solution,) and *Liquor Ammoniae Arseniatis*. These were solutions of either salt, in the proportion of four grains to the ounce; being the same relative strength as the *Liquor Potassæ Arsenitis*, over which it was questionable whether they possessed any advantage.

Arsenici Iodidum, or, as it was sometimes called, *Arsenici Teriodidum*, was ordered in foreign Pharmacopœias, where instructions, not all alike, were given for its preparation. This compound was sometimes used in this country, although not recognized in our Pharmacopœias. A solution of two grains to an ounce of water was found to keep without change, but in a stronger solution a precipitate formed. The author stated that he had tried both glycerine and sugar for preventing the decomposition and precipitation which occurs in the stronger solution, and found sugar to succeed better than glycerine. He had also obtained a similar result with iodide of iron.

Liquor Arsenici et Hydrargyri Hydriodatis, or, as it was sometimes called, *Donovan's Solution*, had been used to some extent, and a formula for it was now given in the Dublin Pharmacopœia. Several modifications in the process for its preparation had been suggested since it was first introduced by Mr. Donovan. The most simple process was that of the United States Pharmacopœia, where iodide of arsenic and red iodide of mercury were directed to be rubbed together with water, and the solution completed by the application of heat.

Quinæ Arsenias, and other compounds of quinine and arsenic, were sometimes ordered in medicine, but there were no formulæ for their preparation in any of the Pharmacopœias.

Ferri Arsenias, obtained in the form of a dirty green precipitate, on adding arseniate of soda to sulphate of iron, was the last of these preparations to which he would refer.

Having thus brought the different medical preparations of arsenic under notice, he thought it worthy of consideration whether any of them, not at present contained in our Pharmacopœia, ought to be introduced there. Arsenic was described by medical writers as a valuable remedial agent, especially for skin diseases and for ague. In the Pharmacopœia of the Hospital for Diseases of the Skin, there were no less than seven different preparations containing arsenic, ordered for internal administration. He might also refer to the popular use said to be made of arsenic in some parts of Lower Austria, where, according to the late Professor Johnstone, it was extensively used by the common people, with the view of improving their personal appearance.

The author concluded with the following remarks: "To return to our subject, would it be advisable to add any of the preparations I have noticed to the future Pharmacopœia? Differences of opinion no doubt exist with reference to this question, and on this account I have introduced the subject for discussion here. It may be urged that the profession have the simple substances and can unite them as they please, but, on the other hand, it is well known that few remedies are much employed until introduced in some well-defined and manageable form. Again, it may be said, that if every preparation used in medicine were introduced into the Pharmacopœia, this work would be rendered too voluminous; but I think that a work for the guidance of every branch of the profession, from the Physician to the Pharmaceutist, cannot contain too large an amount of instruction and information up to the latest date, for it would be far more convenient to refer to one volume for the information required, than to have to search through many works, including journals and pamphlets."—*Pharm. Jour. and Trans.*, May 1, 1857.

DESCRIPTIVE NOTICE OF SOME FRENCH PHARMACEUTICAL SPECIALITIES,

With specimens presented to the Society by D. S. KEMP, Associate and Resident in Paris.

Communicated by Mr. H. C. Baildon.

[The remarks by Mr. Kemp, and those of Mr. Baildon, which follow, are extracted from the proceedings of the Scottish branch of the Pharmaceutical Society, published in the *Pharmaceutical Journal* for May, 1857.—EDITOR.]

Thinking it probable that Mr. Kemp, from the favorable position occupied by him in Paris, might be able to contribute some interesting information connected with French pharmacy, I some time since wrote to him on the subject. In reply, he promised to do so ; and, in February, I had a letter from him, in which he says : “ The usual pressure of business at this season has prevented me fulfilling my promise until now of sending you some matter or other for communication to the Pharmaceutical Society ; I hope, however, it is not yet too late for the season. Finding it quite out of my power at this time to get up anything like a scientific article, I have sent one or two specimens of French Specialities, with a written notice of each, which may possibly interest some of the members of the Society.” He continues : “ I am really sorry that I have not been able to send you something more deserving of your attention ; but I think I may promise you some matter possessing the merit of originality, if I am spared till next season.” In continuation, he writes :

“ This communication is not intended as more than a descriptive notice of the few specimens of French Pharmaceutical Specialities which it accompanies. These are only a selection of the most elegant, from a vast number of others well known in France, and many of which are a source of no little pecuniary gain to their proprietors.

“ Those of the selection in the form of pills are three in number ; two of them preparations of iron, and the third of digitaline.

“ The ‘ *Pilules de Vallet*,’ or Vallet’s Pills, contain the proto-carbonate of iron in a perfect state of preservation. This is effected by the following process :—The sulphate of iron and carbonate of soda are dissolved in water containing a sixteenth of its weight of simple syrup ; the precipitate, washed with water and syrup in the same proportions, and expressed in a cloth saturated with syrup, is well mixed with honey, and evaporated to a proper consistence for pills ; the pills are afterwards silvered and kept in bottles, and contain each about a quarter of a grain of proto-carbonate of iron along with a little inert powder. They are beautifully finished, and preserve their shape for any time.

“ The ‘ *Pilules de Blanchard*’ contain the protoiodide of iron.

They are prepared by evaporating a solution of iodide of iron (prepared in the usual way with iodine and iron filings) along with honey to a thick consistence, and forming a mass by the addition of a little marsh mallow and liquorice powder. In the process, the greatest care is taken to prevent the decomposition of the iodide ; the pills are rolled in powder of iron and on an iron-pill machine, and are finally varnished with a solution of balsam of tolu in ether. Each pill contains one grain of proto-iodide of iron and a sixth of a grain of metallic iron.

“The granules of digitaline form a convenient method of administering that powerful medicine, each containing one milligramme ($\frac{1}{60}$ th of a grain) of digitaline, mixed with powdered sugar.

“The ‘Dragées (or Bonbons) de Gille’ contain also the proto-iodide of iron, about one grain in each. It is contained in a pill in the centre of the dragée.

“The method of their preparation is too obvious to require explanation. It is a form of medicine more suited to the French than to the British taste.

“The next form of medicines shown in the specimens is the most elegant of all.

“The ‘Perles d’Ether’ and ‘Perles de Terebenthine,’ are small gelatine capsules, containing respectively pure ether and turpentine ; they are prepared by a process kept secret by the proprietor, and are of unequalled beauty and finish ; each contains from four to five minims of sulphuric ether or oil of turpentine.

“The capsules of Mathey-Caylus and Raquin are both very fine illustrations of the perfection to which the process of capsulation has been brought.

“Those of Raquin contain copaiva thickened with $\frac{1}{32}$ of its weight of magnesia, and those of Mathey-Caylus are prepared with pure copaiva, copaiva and citrate of iron, copaiva and cubebs, and five other combinations of the same medicine, as well as Venice turpentine.

“The specimen sent contains copaiva with citrate of iron, a very useful combination.

“The capsules of both makers are composed of gluten from oat flour, not gelatine.

“If some of these preparations were manufactured by English or Scotch Pharmaciens, they would probably obtain a reputation equal to that which they hold in France.

“6th February, 1857.”

“D. S. KEMP.

Remarks by Mr. Baildon.

I think, Sir, that you will agree with me, that these specimens are very interesting, and that they demonstrate how very far our ingenious neighbors are before us, even in the mechanical part of our profession. I have never before seen anything at all to compare with the elegance and beauty of finish manifested in the Perles d'Ether. The method of coating pills used by Mons. Blanchard might be applicable not only for all pills kept ready made for sale, but also modified in a way I shall immediately allude to, for pills made to prescriptions, not only to prevent them from hardening, but also most effectually to cover any unpleasant taste or smell. A solution of balsam, of tolu in ether (Mons. Blanchard's method) I did not find sufficiently volatile, as pills coated with it took upwards of three hours to dry, but by using chloroform as the solvent in the proportion of a dram of the balsam to three drams of chloroform, twenty minutes was quite sufficient to make the pills non-adhesive. I have brought specimens of pills varnished with the two solutions named. The chloroform and balsam solution is not only preferable from the shortness of the time required to complete the process, but the pills have a much more finished appearance. The superiority of this method of preserving pills over any kind of powder, appears to me very great, and it is also certainly preferable to the coating of pills with silver leaf. It will, I am satisfied, be found more effectual in preserving pills soft as well as in covering the taste and smell of the drugs used.

Professor Christison states in the introduction to his Dispensatory, “A few years ago it was ingeniously proposed in France to cover pills with gelatine by dipping them into a solution of bone-gelatine or isinglass. The method is troublesome, but otherwise answers well with most pills.” The process just described is equally efficacious, and is attended with but little trouble.

The process was then shown. It consisted in placing a few drops of the solution in a suitable box, shaking the pills in it, and then turning them upon a slab, and so placing them that one pill did not touch another. In a few minutes they were quite dry.

OBSERVATIONS ON ROCK SALT.

By M. MARGUERITTE.

It is well known that when salt is fused, it crystallizes on cooling in various forms, especially in cubes ; these crystals are more or less confused, opaque, and always colored when common salt or crude rock-salt is employed. The results are different when pure salt is calcined, kept in a state of quiet fusion, and cooled slowly ; in this crystals are formed, sometimes of considerable volume, and perfectly transparent.

When protected from the air, rock-salt in its native state, that is to say, presenting various gray, red or brown tints, may be fused without decolorization ; but if the calcination takes place in contact with the air, and, as in the preceding case, the fusion is tranquil and the refrigeration slow, the earthy matters are deposited at the bottom of the crucible, the chloride of magnesium is spontaneously decomposed in contact with the moist atmosphere, the coloring matters are destroyed under the oxidizing action of the air, and all the impurities are eliminated by the crystallization which takes place in the mass ; in this way two very distinct strata, which are easily separated, are formed in the mass. This operation might perhaps be applied with advantage to the purification of crude rock-salt, and also to that of ordinary sea-salt.

The fusion of salt, effected with or without the contact of the air, would explain, up to a certain point, how the salt which is found in the bosom of the earth is contaminated with coloring matters, and how, on the contrary, that which has been exposed to an oxidizing atmosphere is white and transparent.

From these facts we can come to no conclusion as to the origin and formation of rock-salt ; for although by fusion we can obtain salt having the aspect, the transparency, and the physical properties of the latter, it is nevertheless certain that the presence

of organic remains in the heart of the natural product excludes the probability of its igneous formation; and it would also be difficult to understand how, if a fusion of the mass really took place, the chloride of magnesium was not decomposed. As to the phenomenon of decrepitation, since it is observed to a certain extent in rock-salt as well as in that which has been crystallized in the humid way, it cannot serve as a character in support of the hypothesis of igneous formation.—*Chem. Gaz.*, March, 1857, from *Comptes Rendus*, Feb. 1857.

ON THE PREPARATION OF A WRITING-INK IN CAKES.

By A. LEONHARDI.

After the author had discovered the mode of preparation of the so-called alizarine-ink, which is particularly useful, he was anxious to prepare it in a form which would allow it to be sent to a great distance, and at any time of the year render its transport convenient, and diminish its cost considerably, but at the same time fulfil all the requirements of an excellent article. This is attained by the dry alizarine-ink in cakes. The "ink powders" hitherto found in commerce are not to be compared with it, for they not only possess a different composition, but never dissolve completely to form a clear solution in water, and their employment is attended with so many inconveniences and disadvantages, that they have been given up. Common black ink may indeed be evaporated to dryness, but it leaves a residue which does not again dissolve completely in water, and never furnishes a useful ink by this solution. The recipe for the preparation of this cake-ink is as follows:—

42 parts of Aleppo galls and 3 parts of Dutch madder are extracted with a sufficient quantity of hot water; the fluid is then filtered, $5\frac{1}{5}$ parts of sulphate of iron are dissolved in it, and 2 parts of a solution of iron in wood-vinegar, with $1\frac{1}{5}$ part of solution of indigo, are added to it. The mixture is evaporated to dryness at a moderate heat, and formed into cakes of a proper size (for instance 5 inches long, $3\frac{1}{2}$ inches broad, and $\frac{3}{8}$ inch thick).

1 part of this cake-ink dissolved in 6 parts of hot water, fur-

nishes an excellent writing and copying ink, whilst even with 1 part of cake-ink and 10 to 15 parts of water, beautiful writing-inks are obtained.—*Chem. Gaz.*, March, 1857, from *Mittheil. des Gewerbevereins für das Königr. Hannover.*

PREPARATION OF DYE PIGMENT FROM QUERCITRON BARK.

Quercitron bark contains a considerable amount of tannin, which in the dyeing enters into combination with the mordants, and thereby injures the brightness of the colors. When the bark is treated with sulphuric acid the tannin is separated, and the colors then obtained are much brighter and richer.

M. Rigaud's observation that quercitron is converted by the action of sulphuric acid into quercitin was first practically applied by M. Leeshing, who subjected quercitron bark to the action of sulphuric acid.

Hr. Schäffer recommends the following proportions:—

Quercitron bark	100 parts
Water	280 “
Sulphuric acid	26 “

The bark is to be boiled for two hours with the acid, then washed five or six times by decantation, and the residue pressed. This product, when dry, is equal to three times as much of the bark.

Hr. Schlumberger recommends:—

Quercitron bark	100 parts
Water	300 “
Sulphuric acid	15 “

He finds that the conversion of tannin into gallic acid requires a temperature of 212° F.; that neither lime nor potash is extracted from the bark by this treatment. When the product is mixed with cold water, and then with pernitrate of iron, the reaction of tannin is very slight, but an alcoholic decoction gives a precipitate with gelatine. He also finds that when quercitron bark, or the product obtained by the action of sulphuric acid upon the bark, is mixed with tannin, the colors obtained are somewhat darker, but more muddy; the addition of gelatine counteracts this effect completely. When gallic acid was added in the dye-

ing operation, the mordants were dissolved, as might have been expected, in accordance with the results obtained by Prof. Calvert. This fact shows further that the gallic acid produced by the action of sulphuric acid upon the tannin of the quercitron bark is removed by the washing, for otherwise the dyeing capability would be reduced instead of increased by this treatment.

By the treatment of quercitron bark with sulphuric acid the color substance must have undergone a change, because the color is fixed by mordants only at a high temperature, and is almost insoluble. An aqueous decoction deposits on cooling a copious yellow sediment, which appears to be Rigaud's quercitin.

Logwood, Lima wood, sandal wood, turmeric, Cuba wood, sumach, yellow berries, woad, galls, and pomegranate shells were subjected to the action of sulphuric acid in a similar manner, then washed, pressed, and dried. Hr. Schlumberger found that logwood, Lima wood, and sandal wood were injured by this treatment, but that the result was very advantageous with the other dye stuffs. The most striking effect was produced with sumach, when the water was mixed with 40 or 50 per cent. sulphuric acid by volume. The product, which may be called sumacin, thus obtained, gives finer yellow, grey, and black than quercitron, and the dyeing capability is increased fourfold; when mixed with garancin the color obtained has more body, and the violet is not injured so much as is the case in dyeing with an admixture of wood containing tannin. Woad likewise acquires a much greater dyeing capability by the action of sulphuric acid, and the color it gives is purer, but it requires then a temperature of 158° F. for dyeing.

Yellow berries, Cuba wood, and turmeric, treated in the same manner, give very satisfactory results in dyeing. For these substances, the liquid should contain from 15 to 20 per cent. concentrated sulphuric acid. The tannic acid of nutgalls and of pomegranate shells is not all converted into gallic acid by the action of sulphuric acid, but more color substance is set at liberty. The colors produced with aluminous mordants are more decidedly yellow, and those produced with iron mordants are clearer. A stronger acid should be used for nutgalls than for pomegranate shells.—*London Pharm. Jour.*, May 1, 1857.

ON THE TOXICOLOGY OF STRYCHNIA.

BY J. E. D. RODGERS, ESQ.,

Lecturer on Chemistry at St. George's School of Medicine; and

G. P. GIRDWOOD, ESQ.,

Assistant-Surgeon, Grenadier Guards.

Can strychnine be detected after death, when it has been administered in a dose only sufficient to destroy life? or is it so altered in the process of destruction of life, as to cease to be strychnine? are questions that it is the object of this paper to answer.

Let us first inquire the facts upon which the opinion that strychnine *cannot* be detected in the tissues and fluids of the body is based, and it will soon be seen that they are of the most slender nature, founded on the results of experiments and analyses of a most unsatisfactory and imperfect character.

Dr. Christison many years ago, poisoned animals with doses of strychnine varying in strength, and generally failed in its discovery by subsequent analysis. Dr. Taylor, at the trial of William Palmer, gave in evidence that he had killed four rabbits by the administration of strychnine. In the first experiment he gave two grains; in the second and third, one grain; and in the fourth, half a grain; and failed to discover it by chemical means in three out of the four—the successful case being that in which he had given the large dose of two grains—a dose which every one must admit far exceeds the quantity necessary to destroy life. Drs. De Vry and Van de Burgh, from their interesting and well-devised series of experiments, the results of which were given in a paper read at the last meeting of this Society, have come to the conclusion that it can only be detected when the dose given exceeds that necessary to destroy life.

Let us next inquire what are the essentials of a process that will enable the analyst to obtain the strychnine in such a condition as to prove its presence indubitably. They are, that it should be capable of disintegrating the substances in which it is present, so completely, that it cannot escape solution; and that, finally, it should yield the strychnine in a state of perfect freedom from foreign organic matter.

Have the processes employed by Drs. Christison, Taylor, De Vry, and Van de Burgh these requisites? Decidedly not. The

process given by Dr. Taylor at the trial of Palmer—and Dr. Christison stated on that occasion that he had pursued a similar mode of analysis—consisted in digesting the matter suspected in spirit of wine acidulated with sulphuric acid, filtering, gently evaporating, and finally adding carbonate of potash to precipitate the strychnine, which was then tested. We need scarcely remark that such a process would never yield strychnine, if present in minute quantity, in that state of freedom from organic matter to admit of satisfactory testing, and would utterly fail when blood, urine, and tissues were the subjects of analysis; indeed, it is obvious that the minute quantity to be extracted in the latter analysis could never be precipitated at all, seeing that each drop of water is capable of retaining $\frac{1}{7000}$ of a grain of strychnine. The process of Staâs adopted by Dr. De Vry is immeasurably superior to the preceding, but that it is not possessed of the requisite degree of perfection is evident from his own experiment cited in proof of its perfection. This experiment, you may remember, consisted in mixing the quarter of a grain of strychnine with one egg, and then coagulating the mixture by the heat of boiling water, and subjecting it to Staâs' process, by which he recovered "*almost the whole*" of the strychnine. This word "*almost*" proves the imperfection of the process, for it shows that under favorable circumstances a quantity appreciable by the balance was lost, while in the analysis of urine, bones, and small quantities of the other tissues, you have to separate an amount of poison that is quite inappreciable by the balance. The loss is owing to the fact that the spirit of wine and acid employed do not disintegrate the tissues in the manner necessary for the separation of the quantity of strychnine conveyed by the blood to the various tissues and organs; indeed, the hardening effect of the spirit would rather favor the retention than the separation of the strychnine.

The process adopted by us is as follows:—The substance operated upon is digested with dilute hydrochloric acid, one to ten, until it is apparently fluid; the liquid is then filtered and evaporated to dryness over a water-bath, treated with spirit as long as anything is dissolved, and the filtered tincture evaporated as before, and the residue treated with water and filtered; this aqueous solution must now be rendered alkaline by ammonia,

and agitated in a bottle or long tube, with about half an ounce of chloroform; after subsidence, the chloroform is drawn off by means of a pipette, transferred to an evaporating basin, and the chloroform expelled over a water-bath; the residue must then be moistened with concentrated sulphuric acid, and exposed for some hours to the temperature of a water-bath, by which proceeding, all organic matter except the strychnine is destroyed. The charred mass is then treated with water, and the solution filtered to separate the carbon; excess of ammonia is now added, and the solution again agitated with about one drachm of chloroform; if on evaporating a small portion of this chloroform solution, and treating the residue with concentrated sulphuric acid, any charring takes place, the preceding process must be repeated, when the last chloroform solution will afford the strychnine sufficiently pure for conclusive testing. For this purpose a small quantity is taken up in a capillary tube, and allowed to evaporate on the smallest spot possible of a warm porcelain capsule, by adding successive drops until the whole is evaporated on the spot. If the quantity is large—say from $\frac{1}{2000}$ of a grain to a larger quantity—the method we have pursued is similar to that employed by Dr. De Vry and others, viz., moistening the spot (when the capsule is quite cold) with concentrated sulphuric acid, and then adding a minute fragment of bichromate of potash. If, however, the quantity is very small, no color will be perceived by this mode of testing, then the sulphuric acid rendered slightly yellow by chromic acid will be found successful.

We would here remark that the recommendation to stir the spot moistened with sulphuric acid with a glass rod, previous to the addition of the bichromate, is highly objectionable, and will frequently occasion failure, by removing the acid sulphate of strychnine, which would otherwise, by adhering to the porcelain, facilitate the action of the test. The superiority of our mode of operating will be seen by the following analyses, performed during the last few days. On the 26th ult., at three o'clock P.M., 1-30th of a grain of strychnine was given to a rabbit weighing nearly four pounds; at four a second 1-30th; at half-past four a third dose was administered, after which he evinced slight signs of twitching on being touched, or on a noise; at five a fourth dose was given; at half-past five a glass beaker fell

and was broken near him, which caused a sudden spasm with opisthotonos (lasting fifteen seconds); at quarter to six another 1-30th (making 5-30ths) was given; at twelve minutes past six a bunch of keys was dropped near him; the noise occasioned an immediate spasm, accompanied, as before, with opisthotonos, which lasted a few seconds; a second on touching him, followed by a remission, when, on again touching him, a third attack was produced, which ended fatally in a few seconds, relaxation of all the muscles indicating decease; rigor mortis came on in three minutes after death, and passed off in the succeeding twenty-four hours. On examination the blood was found coagulated. The contents of the stomach, analyzed by the process given, yielded strychnine in abundance.

Half pound of flesh also yielded strychnine in abundance. Two drachms of urine collected after death, also yielded strychnine by the following mode of analysis: it was diluted with an ounce of water rendered alkaline by ammonia, and filtered; the filtrate was then agitated with chloroform in a long tube, the chloroform separated as directed, was then evaporated in a porcelain dish, the residue charred with sulphuric acid, as already detailed; this operation was repeated three times, when the last chloroform solution yielded the strychnine as stated.

The bones of the extremities, the pelvis, and part of the vertebral column, containing its share of the spinal marrow, all being entirely denuded of flesh, were treated as follows: They were covered in a deep evaporating basin with dilute hydrochloric acid, and digested over a water-bath until the whole were dissolved; the solution filtered, the filtrate was then treated with concentrated sulphuric acid drop by drop as long as a precipitate fell, adding water when necessary; the solution was again filtered, and about six drachms of sulphate of magnesia and ammonia in excess added; the solution was again filtered, and the clear liquid agitated with chloroform; the chloroform solution, after being treated in the way already detailed, yielded distinct evidence of strychnine.—

To these results must be added our former experiments, which we have already published, and which were briefly as follows:—

The blood and contents of stomach of a dog poisoned by two grains of strychnine were, after putrefaction, subjected to analysis, both yielding strychnine.

The muscles, viscera, and bones of a dog, poisoned with a grain of strychnine, were separately subjected to analysis, thirteen months after interment. Strychnine was discovered in every instance.

The organs and contents of stomach of a rabbit, poisoned by half a grain of strychnine, yielded that alkaloid in each analysis.

The viscera and contents of stomach of a rabbit poisoned by half a grain of strychnine and five grains of tartar emetic, yielded antimony and strychnine also in each analysis.

The body of this rabbit was allowed to decompose in contact with air for nine months. When dry, the bones separated, and all the other tissues, almost pulverulent, subjected to the mode of analysis described by us for the bones, yielded abundance of strychnine.

From the results of the foregoing experiments, we cannot avoid the following conclusions:—

(1.) That the opinion, that strychnine can only be detected when the poison is in excess, is untenable, and not supported by trustworthy analyses.

(2.) That the opinion, that strychnine is decomposed in the process of destruction of life, is founded on the results of analyses made by imperfect processes, and hence is unsound and unphilosophical.

(3.) That strychnine can always be detected, when it has occasioned death, in the blood, organs, and tissues of the body, quite independently of the contents of the stomach.

(4.) That it is found unchanged in the urine.

(5.) That the delicacy of the reactions of strychnine, and its extraordinary stable qualities, render its detection more certain than any other poison.—*London Pharm. Journ.*, April, 1857.

ON MAGNESIUM, ITS PREPARATION AND VOLATILIZATION.

By MM. H. SAINTE CLAIRE DEVILLE and CARON.

The chemical properties of magnesium have been determined with great perfection by M. Bussy, who discovered this metal, and all the experiments since made have confirmed his results.

One of the physical properties of magnesium, however, has

not hitherto been ascertained ; it is a new fact which still further approximates zinc and magnesium, and gives them an additional property in common. Magnesium is volatile, like zinc, and nearly at the same temperature. Thirty grammes of it have been distilled with ease in charcoal vessels. When the magnesium is pure it leaves no residue, and the sublimed metal is white and surrounded by a small quantity of oxide. When it is impure, it leaves in the charcoal tray a certain quantity of very light and complex black matter, and the distilled magnesium is covered with little colorless, transparent needles, which are rapidly destroyed with formation of ammonia and magnesia, indicating the probable existence of a nitruret of magnesium analogous to the remarkable bodies already discovered by Wöhler and Rose for a certain number of simple bodies.

Magnesium fuses at a temperature very near that of the fusion of zinc. At a temperature a little higher it ignites, producing a brilliant flame, in the midst of which indigo-blue tufts are seen, especially when a jet of oxygen is thrown upon the fused metal from an oxyhydrogen blowpipe. The combustion of magnesium is accompanied by all the phenomena observed with zinc, denoting a volatile metal, the oxide of which is fixed and infusible ; a brilliant flame, a deposition of magnesium flakes and a rapid combustion.

The density of magnesium is 1.75. The malleability and ductility of magnesium, and the dependent physical properties, are still under investigation, as well as its electrical conductivity, which is interesting on account of its extreme lightness. It files very easily and burnishes wonderfully. It resists the air very well, especially when it is pure and its surface is polished ; it is therefore comparable in this respect with zinc, which perhaps is a little more resistant.

Magnesium may be prepared by the process employed for aluminium, which, however, must be slightly modified, as magnesium is lighter than the scoria from which it is produced. 600 grms. of carefully prepared chloride of magnesium are mixed with 100 grms. of fused sea-salt (or better, of a mixture of chloride of sodium and potassium) and 100 grms. of pure fluoride of calcium, the whole previously powdered. 100 grms. of sodium in fragments are added and mixed intimately with the powdered

chloride, and the whole is thrown, by means of a little iron spatula, into a red-hot earthen crucible, which is closed with its cover. In a short time the reaction takes place. When all noise has ceased, the crucible is uncovered, and the mixture is stirred with an iron rod until all the fused parts are homogeneous and the upper part of the bath is well exposed, when the globules of magnesium are distinctly seen. The crucible is allowed to cool away from the fire, and when the saline mass is ready to solidify, it is again stirred with the iron rod, and all the little metallic masses are collected so that they may form a single one; the whole is then poured upon a plate of iron. By breaking up the scoria the globules of magnesium may be removed, and the scoria may be fused once or even twice, affording a little more magnesium each time; 600 grms. of chloride of magnesium, with 100 grms. of sodium, gave 45 grms. of magnesium.

The crude magnesium is put into a charcoal tray, enclosed in a tube of charcoal, and heated nearly to whiteness, whilst a slow current of hydrogen traverses the apparatus. The tube is strongly inclined in the furnace, and all the magnesium condenses in front of the tray and is easily collected when the tube is cold. It is then fused in a mixture of chloride of magnesium, chloride of sodium, and fluoride of calcium. By gradually increasing the quantity of the latter, which is added by degrees to the fused bath, the scoria is rendered less fusible than the magnesium, so that the latter may be poured off just as the scoria is about to solidify.

When the current of hydrogen is strong in the distillation of magnesium, a small quantity of a fine metallic powder is carried a good way, and remains suspended in the hydrogen which escapes from the apparatus. If this gas be ignited it produces a most beautiful flame.—*Chem. Gaz.*, April, 1857, from *Comptes Rendus*, Feb., 1857.

ON SCILLITIN.

By M. MARAIS.

[The following notice of scillitin is taken from an extended essay on Squill by the author, accessible in the *Chemist* for April, 1857, and in the *Journal de Pharmacie*, Feb., 1857. According to the author squill

contains the following substances, viz., vegetable mucilage 30; sugar 15; tannin 8; acid red coloring matter 10; yellow odorous acid coloring matter 2; fatty matter 1; scillitin 1; iodine *traces*; salts 5.—EDITOR AM. JOURN. PHARM.]

M. Marais has devoted the fifth chapter of his work to the recapitulation of the numerous attempts which he made, before succeeding, in isolating the active principle of the squill, to showing the best method of obtaining it, and of defining its characteristics.

Struck with the persistence of the acid reactions of the active principle of the squill, which he found in all the products of the analysis, by means of the bitter taste which characterises it, he has supposed that it exists in the plant in a state analogous to a salt, and that the intervention of an alkaline base would be necessary to its elimination. These various considerations have led him to the following process:—

Prepare a concentrated tincture of squill with alcohol, at 0.90 or at 0.56, according to whether the squill is fresh or dry. This tincture is precipitated with clear milk of lime, and on to the whole is poured a sufficient quantity of ether to form, when the mixture is agitated and suffered to stand, a magma covered with a certain quantity of alcoholic and ethereal liquor, which is immediately decanted. The magma is washed with fresh ether until it has lost all its bitterness. The united liquors are distilled, until there only remains in the retort the alcohol, with the scillitine and a little fatty matter. This solution evaporated as rapidly as possible at a gentle heat, leaves a residue, which is taken up again with alcohol at 90° to dissolve the scillitine, and eliminate the fatty matter; the bitter liquor, evaporated in its turn to complete dessication, leaves the scillitine, which is removed in little lamellæ, and immediately put into a well closed phial.

There only appears to be about one per cent. of scillitine in the squill. It is uncrystallizable, hygrometric without being deliquescent, because insoluble in water; it is very soluble in alcohol and ether without heat. It is in pale yellow semi-transparent lamellæ; if, after being dissolved in a little alcohol it is precipitated by water, it is deposited very white, but it retakes its color and semi-transparency by dessication. It has a

penetrating intensely bitter taste, which is increased by the presence of water.

Concentrated sulphuric acid dissolves scillitine, causing a beautiful violet color, exactly similar to that which the same acid produces with cod-liver oil. Water instantly causes the disappearance of this color, and the deposition of a green precipitate. If, after adding a very little water more sulphuric acid is added, the original color reappears.

Concentrated nitric acid dissolves scillitine, causing a bright red color, which disappears quickly. The addition of water forms no precipitate. Whether concentrated or weak, hydrochloric acid does not dissolve scillitine, and gives no characteristic reaction. Hydrated alkalies disengage ammonia from scillitine, and thus show that it contains nitrogen.

Concentrated solutions of ammonia and potassa do not dissolve scillitine, but they decompose it and remove its bitterness. It gives a pale yellow precipitate with tannin; with perchloride of iron, an orange precipitate; with perchloride of platinum, a yellow precipitate.

Projected on a sheet of platinum heated to redness, it liquifies, turns brown, catches light, swells up, becomes black, and disappears without leaving any residue.

Scillitine resembles the alkaloids in many points, which further experiments will doubtless render evident. Its reaction is alkaline, it contains nitrogen and forms a combination with acetic acid.

Scillitine has been the subject of several toxicological studies made by Dr. Gosselin, assisted by M. Adrien Bussy. These experiments have given the following results:—

1. That Scillitine has all the characters of the acro-narcotic poisons described by Orfila.

2. That it is very poisonous in the dose of five centigrammes, and causes a strong inflammation of the digestive apparatus, even in the dose of from three to four centigrammes.

3. That when injected into the œsophagus, its first effect is to produce vomiting and violent purging; narcotism then manifests itself, and death appears to ensue from paralysis of the heart.

4. That scillitine, applied by the endermic method, acts much

more quickly than by way of the stomach, that its action in this case is almost exclusively narcotic, and that it killed a rabbit in 37 minutes, in the dose of 0.02 gr., and a vigorous dog in an hour and 22 minutes, in the dose of 0.04 gr.

NOTE ON THE TRANSFORMATION OF SOLUBLE GUMS INTO INSOLUBLE GUMS.

By M. A. GELIS.

Although gummy matters are found in almost all plants, they have hitherto been the subject of very few observations. M. Guérin Vary is almost the only chemist who has studied in a consecutive manner their analysis and their transformations. He has extracted from natural gums various substances, all of which possess the property of giving mucic acid when they are heated with nitric acid, and from all these substances he formed a genus whose species are—Arabine, Bassorine, and Cerasine. Berzelius has not adopted this division; he gives the name of *gum* only to matter soluble in water, which forms almost the whole of gum Arabic and gum Senegal, and he separates, under the designation of vegetable mucilage, the principle insoluble in water, which communicates to the gum of Bassora, to gum tragacanth, to linseed, and to quince-seed, &c., the property of swelling up very considerably in this liquid.

The analogy which exists between gums and starch, and the apparent resemblance which is observed between paste and vegetable mucilage, led us to think that this property of swelling up in water which certain gummy matters possess, was due to a kind of organisation existing, in different degrees, in a different species. According to this view, and by establishing, for gum, a series parallel to that of starch, we should be in some measure forced to consider cerasine and bassorine as representatives of organised fecula, and arabine as the analogue of dextrine. The observation which forms the subject of this note is of a nature to lead us to the contrary opinion, since, by heating gum Arabic—that is to say, by placing it in conditions of disorganisation, I have converted it into a principle possessing all the properties of the mucilage of Berzelius.

When powdered gum Arabic is heated to 100° C. (212° F.), a certain quantity of water is removed from it, and its composition may then be represented by the formula $C^{12}H^{11}O^{11}$. At 120° C. (248° F.), it loses another equivalent of water, and becomes isomeric with very dry starch, $C^{12}H^{10}O^{10}$. In this state it has experienced no change in its nature; it is still entirely soluble in water, with the exception of a slight calcareous deposit which precipitates from its solutions. But when the temperature of 120° C. (~~212°~~ 248° F.) is exceeded, and that of 150° C. (302° F.) reached, or if it be only continued for a long time, it is remarked that almost the whole of the gum loses its solubility, and is converted into a mucilaginous matter, insoluble in cold water. This reaction is effected without loss of water, as I ascertained by weighing several times the flask in which I heated the dried gum; and it is quite comparable to that which converts starch and soluble starch into dextrine.

To obtain the perfectly colorless product, several precautions must be taken. It must not be heated, for gum is very rapidly colored by the action of fire. At the temperature of 150° C. (302° F.), the parts nearest to the metallic bath or the oil bath are perceptibly yellow, but the centre of the mass has been modified without coloration.

Gum thus treated is insoluble in cold water, and it is separated, by means of this liquid, from that which has not been altered. It swells up in cold water much less than tragacanth, but quite as much as the cerasine extracted from the gum of this country. When, instead of heating gum Arabic in powder, we heat it in pieces, the product obtained acts in water like the gums of cherry and apricot trees, &c., from which it would be very difficult to distinguish them.

In presence of these characters, we are tempted to admit the identity of the two matters, especially when we reflect that the metamorphosis which forms the subject of this note is produced without loss of water, and that cerasine and arabine have exactly the same composition in hundredths.

Be this as it may, modified gum, or artificial cerasine, has all the known properties of the mucilage of Berzelius.

Treated with nitric acid, it furnished me an abundant crys-

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tallization of mucic acid, and, like gum tragacanth and indigenous gum, it gives rise, by boiling in water, to a new soluble gum.

This gum is generally regarded as arabine; I thought at first that it should rather be analogous to the gummy matter which MM. Biot and Persoz obtained by boiling 8 parts of gum Arabic in $17\frac{1}{2}$ parts of warm water, acidulated with 2 parts of sulphuric acid, a matter which they compared to dextrine; but I dare not yet express myself positively, for this regenerated gum acts at 150°C . (302°F .) like arabine itself, and constantly reproduces artificial cerasine.

The question might perhaps be decided by examining comparatively the rotatory power of these substances, but having no instrument, I have not yet been able to make this verification.—*London Chemist*, May, 1857, from *Comptes Rendus*, Jan. 26, 1857.

VALERIANATE OF AMMONIA.

This substance appears to attract considerable attention, as a remedy for neuralgia, and has been the subject of a somewhat unseemly squabble among certain members of the Parisian faculty; but with this we have no concern. When we first saw a notice of it in the periodicals, we could find no mention of its mode of preparation; and as the dose spoken of was by spoonfuls, manifestly of a solution of unknown strength, we were thrown on our own resources to prepare it. Accordingly, we mixed equivalent solutions of valerianate of zinc and carbonate of ammonia, and removing the carbonate of zinc thus formed by filtration, evaporated the filtered liquid, and finding that it would not crystallize, dried and powdered the residue. We found this to be a very expensive process, the product being considerably less than what theory would lead one to expect. M. Laboureur being, like ourselves, without a guide, has also been experimenting; but the process which he adopted was to pass dry ammoniacal gas through mono-hydrated valerianic acid, when he obtained a product perfectly white, and confusedly crystallized. Its composition is, one equivalent of valerianic acid, one of water, and one of

ammonia ; or, one equivalent of valerianic acid, and one of oxide of ammonium, according to the theory you adopt. It is very deliquescent ; when placed on water or alcohol it gyrates rapidly, according to the custom of the valerianates. It has a mixed odor of valerianic acid and of ammonia, but soon loses the latter when put in an exhausted receiver. Its reaction is slightly acid, even when dissolved in water or alcohol. Ether dissolves it, forming an oily liquid ; so do the oils, although more slowly. Oil of turpentine gives it the appearance of transparent plastic fat. Heat partially decomposes it, and what remains re-crystallizes by cooling. The acids decompose it, liberating the valerianic acid, which swims on the surface of the liquid.

It appears now, however, that the medicine first introduced to the notice of the profession by Déclat, is a solution of valerianate of ammonia of a fixed strength, which has long been prepared by M. Pierlot, a pharmacien in Paris, and which has been extensively exhibited to the epileptics, both at the Salpêtrière and the Bicêtre. M. Pierlot has at length published his formula, which is as follow :—

Distilled water, 32 drachms,

Valerianic acid, 1 drachm,

Sub-carbonate of ammonia, q. s.

To neutralise the acid, add—

Alcoholic extract of valerian, 2 scruples.

His object in the construction of this formula, he says, was to obtain a concentrated solution of all the constituents of valerian root, in a condition as little disagreeable as possible. He maintains that valerianic acid pre-exists in the root, and is an educt, not a product, as hitherto presumed.

However that may be, there seems to be some virtue in the medicine. Dr. Desmarres describes a case of intense choroiditis, in which, after considerable depletion and low diet, severe paroxysms of neuralgia supervened. Doses of a grain and a half of sulphate of quinia seemed merely to exasperate the pains. He then tried Pierlot's solution of valerianate of ammonia, in doses of three coffee-spoonfuls per diem ; and the first day the pains so far remitted, that the patient obtained a tranquil sleep, and in a few days more he quite recovered his appetite. Dr.

Tufnell, Professor of Military Surgery in this city has also tried it in some cases, and found it eminently successful.—*London Chemist, May, 1857, from Dublin Hospital Gazette.*

SANTONIN AS AN ANTHELMINTIC.

By G. G. PERRY, Esq., Droxford.

The very satisfactory effects of Santonin in expelling round and thread intestinal worms are not generally known. Mr. Perry, who has tried its effects in many cases, says :

Among the first cases treated, was that of a child of two years of age, to whom I gave three grains of santonin, followed in two hours by an aperient powder; this child voided the next morning, at one time, thirty-seven worms, some of them a foot in length, of the lumbricoid ascaris kind. Two children in another family were similarly treated, and between forty and and fifty worms came from each; again, in a family of four, 124 worms at one time, and many more afterwards, followed the aperient, each child having taken one dose of santonin. I could instance many more cases which have been relieved by this medicine. After the expulsion of the worms, I give a tonic mixture, containing the muriated tincture of iron and muriatic acid, and change the diet from a vegetable one to that of meat and bread. My cases all do very well.

I should state that santonin is a medicine that may be administered with perfect safety. I give it in its crystallized form, between bread and butter, and two hours after it a dose of calomel and jalap; in some cases an interval of twenty-four hours occurs before the worms are voided.

The persons who reside in the locality in which I have met with these cases, are very poor, and from the high price of bread this winter, have had recourse to vegetables of the commonest description, as an article of food, which will account for the presence of worms in the alimentary canal.—*London Chemist, May, 1857, from Medical Times and Gazette.*

CHROMATE OF POTASSA AND SULPHURIC ACID REAGENTS
FOR DIFFERENT ORGANIC BODIES.

BY PROF. EBOLI, of Lima.

A number of organic alkalies and other bodies give, with the above tests, very characteristic reactions, and may, according to the author, prove very useful in chemico-legal examinations. One or two milligr. of the substance are placed on a watch glass, then five or six drops of diluted sulphuric acid (equal weights of acid and water) are dropped on it, and a small piece of chromate of potassa put in the liquid. Each of the following changes of color occupies several hours :—

Morphia : nickel green, copper green, at last a dirty dark green.

Sulph. Morphia : nickel green, copper green, dark yellow.

Acet. Morphia : nickel green, copper green, greenish blue.

Quinia : Scheele's green, beautifully green yellow, dark green.

Sulph. Quinia : nickel green, copper green, dirty yellow.

Ferro-cyan. Quinia : dirty green, leaf green, dirty yellow, chocolate color.

Cinchonia : Scheele's green, green yellow, dirty dark yellow.

Sulphate Cinchonia : Scheele's green, copper green, dirty dark yellow.

Veratria : dirty green, bottle green, nickel green turbid, afterwards clear, copper green turbid, at last dirty dark yellow.

Atropia : after several minutes nickel green, yellow green, dirty yellow green, and a yellowish precipitate soluble in alcohol.

Delphinine : dirty green, clear, then turbid nickel green, dirty yellowish.

Lupuline : greenish yellow turbid, dirty green yellow.

Codeine : Scheele's green, nickel green, copper green, dirty dark green.

Daturia : copper green, greenish blue.

Strychnia : intensely violet, almost black near the chromate, violet yellow, after two days blue. Graham and Hoffmann had already observed the violet reaction.

Caffeine and Naphthaline : no reaction.

Piperine : greenish yellow, nickel green, dirty green.

Cantharidine must be heated with concentrated sulphuric acid

to near boiling, the fire removed and the chromate added, an effervescence takes place, after which a beautiful green mass is found, which dissolves after several hours and at last turns a dirty leaf green.

With a solution of the chromate the above reactions take place instantaneously, so as to make it impossible to observe the changes of color.

J. M. M.

Chem. Central Blatt, 1856, 338. *Messagero de Lima*.

NOTICE.

TO THE PHARMACEUTISTS AND DRUGGISTS OF THE UNITED STATES.

The Sixth Annual Meeting of the American Pharmaceutical Association will be held in the city of Philadelphia, on Tuesday, 8th of September ensuing, at 3 o'clock, P. M., in the Hall of the College of Pharmacy, Zane st. above 7th.

The object of the Association, and the conditions of membership are explained in the following extracts from the Constitution.

ARTICLE I.

1st. To improve and regulate the drug market by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulteration.

2nd. To establish the relations between druggists, pharmacutists, physicians and the people at large, upon just principles, which shall promote the public welfare and tend to mutual strength and advantage.

3rd. To improve the science and the art of pharmacy by diffusing scientific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4th. To regulate the system of apprenticeship and employment so as to prevent as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5th. To suppress empyricism, and as much as possible to restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

ARTICLE II.—Of the Members.

Section 1. Every pharmacist or druggist of good moral and professional standing, whether in business on his own account, retired from business or employed by another, who, after duly considering the objects of

the Association and the obligations of its Constitution, is willing to subscribe to them, is eligible to membership.

Section 2. The mode of admission to membership shall be as follows: Any person eligible to membership may apply to any member of the Executive Committee, who shall report his application to the said Committee. If after investigating his claims they shall approve his election, they shall at the earliest time practicable report his name to the Association, and he may be elected by two-thirds of the members present on ballot. Should an application occur in the recess, the members of the Committee may give their approval in writing, which, if unanimous, and endorsed by the President, shall constitute him a member, and the fact be reported to the Association at the next succeeding meeting.

Section 4. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution, and is liable to lose his right of membership by neglecting to pay said contribution for three successive years. Members shall be entitled, on the payment of three dollars, to receive a certificate of membership signed by the President, Vice-Presidents and Secretary, covenanting to return the same to the proper officer on relinquishing their connection with the Association.

Section 5. Every local Pharmaceutical Association shall be entitled to five delegates in the annual meetings, who, if present, become members of the Association, on signing the Constitution, without being ballotted for.

GEO. W. ANDREWS, President.

Baltimore, May, 1857.

Varieties.

Extract from an elaborate Report to the British Government on the mode of detecting Vegetable Substances mixed with Coffee for the purpose of adulteration. By Prof. GRAHAM, Dr. STENHOUSE and Mr. CAMPBELL.

[The Report from which this extract is taken is too extensive for introduction into this Journal. Those who wish to consult the whole paper will find it in the April and preceding numbers of the Pharmaceutical Journal. Unusual interest attaches to the 11th section, from the facts there stated in reference to Kinone.—ED. AM. JOURN. PHARM.]

The action of the more ordinary chemical reagents upon infusions of coffee and chicory may now be noted. The indications thus obtained with coffee are unfortunately rendered much less characteristic by the torrefaction of the seed.

TABLE X.

Action of certain Chemical Reagents upon Infusions of Coffee and Chicory.

	Raw Coffee.	Roasted Coffee.	Raw Chicory.	Roasted Chicory.
Potassa.....	A bright reddish-yellow liquid, and no precipitate.	Brownish-yellow liquid, and no precipitate.	Not altered.	Not altered.
Lime-water.....	Pale-yellow liquid; on standing, becoming green at the surface, no precipitate.	Reddish-brown, with shade of purple, and no precipitate.	Not altered.	Not altered.
Acetate of copper...	Dirty green precipitate.	Brownish-green precipitate.	Pale-green precipitate.	Gelatinous precipitate of a reddish-brown color.
Perchloride of iron..	Deep greenish-black precipitate.	Very dark greenish-black precipitate.	Blackish-brown colored liquid.	No effect.
Nitric acid.....	Bright red-colored liquid.	Clear port-wine-colored liquid.	No effect.	No effect at first; on standing, port wine color.
Sulphuric acid.....	Dirty blackish-brown-colored liquid	Dark blackish-brown colored liquid.	Deep blackish-brown-colored liquid.	Brownish-black liquid.
Hydrochloric acid...	Pale brownish yellow liquid.	Port-wine-colored liquid.	No effect.	Slightly darkens the liquid.

In allowing a solution of unroasted coffee to stand, its green color becomes gradually deeper. This change is due to oxidation and the formation of the viridic acid of Rochleder. It is promoted by the presence of an alkali; an excess of lime brings out this color very strongly in a day or two,—giving at first, however, a bright yellow color. Subacetate of lead gives, in unroasted coffee, a yellow precipitate, which does not become green. An excess of acetate of copper gives a green precipitate in abundance, which is brightened by the addition of an alkali. This copper precipitate has been used as a green pigment. The reactions above described are, however, much altered and obscured by the roasting of the coffee, and are therefore of little service for our present purpose.

It has already been stated that iodine produces no blue coloration in the infusion of either coffee or chicory. If the reagents named act clearly in a different manner upon any infusion from what they do upon pure coffee, a presumption of adulteration is obtained, but the indications must be of a positive and specific nature fully to establish adulteration.

Coffee was submitted to the usual process of distillation with soda-lime for the determination of its nitrogen. The proportion of nitrogen per cent. was, in coffee, sample 1 (Table VII.), roasted, 2.93; in sample 2, roasted,

2.62; in sample 3, raw, 2.53, roasted, 2.70; in sample 4, raw, 2.71; in sample 5, raw, 2.50, roasted, 2.49. The proportion of nitrogen in roasted coffee appears therefore to lie between two and a half and three per cent.

The nitrogen in a specimen of foreign chicory amounted in the raw chicory, to 1.51 per cent.; in the same roasted, 1.42 per cent. The same of English growth gave, in the raw state, 1.86 per cent. of nitrogen; and in the roasted state, 1.74 per cent.

The proportion of nitrogen in coffee is therefore greater than in chicory; but the difference is not sufficiently marked to distinguish the two substances easily from each other. The conclusion may, however, be drawn, that less than two per cent. of nitrogen in coffee is a strong presumption of adulteration.

We may now advert to the peculiar and characteristic substances found in coffee, and the aid to be derived from them in the discovery of adulteration.

Professor Rochleder, who has devoted great attention to the analysis of coffee, gives the following enumeration of the substances found in the raw coffee-bean, with the formulæ of their elementary composition:—

	C.	H.	O.	N.
Woody fibre . . .	12	10	10	
Cane-sugar . . .	12	11	11	
Fat { Palmitic acid . . .	32	32	4	
{ Oleic acid . . .	36	34	4	
{ Glycerine . . .	6	8	6	
Legumin . . .	48	36	14	6
Caffeic acid . . .	16	7	6	
Caffeine . . .	16	10	4	4

To these Rochleder had lately added citric acid ($C_{12}H_5O_{11} + 3HO$), in the small proportion of two grains in a pound of coffee; also a trace, too small to be estimated by weight, of viridic acid ($C_{14}H_6O_7$). This last substance is the acid obtained by exposing solutions of the neutral and basic caffees to the influence of the air. The green color of raw coffee is believed by Rochleder to be owing to a small quantity of viridate of lime.

The evidence upon which Rochleder rests the existence of palmitic and citric acids in coffee does not appear to us quite decisive. The formulæ given by that chemist for both caffeic and viridic acids are doubtful.

It is also stated by Rochleder, that when dried caffeic acid is submitted to destructive distillation, a small quantity of crystals were obtained, which he considered to be pyrocatechine. The experiment repeated by us on a considerable scale gave a negative result.

Rochleder finds caffeic acid in Paraguay tea (*Ilex Paraguayensis*), as well as in coffee. This statement we must also doubt. The acid of the Paraguay tea has been examined by us, and found to have a certain resemblance to caffeic acid, but not to be identical with it. Free caffeic

acid, when strongly heated in an open vessel, emits the peculiar odor of roasted coffee; but the acid from Paraguay tea emits a perfectly different odor when similarly treated.

The sugar of coffee may be inferred to exist in a peculiar condition, as was before hinted, from the fact that when the coffee is roasted, none of its sugar appears to be converted into grape-sugar, as it does not affect Trommer's test; while, when seven grains of cane-sugar were added to 100 grains of coffee, and the whole roasted in the usual way, abundant indications of grape-sugar were obtained by the same test.

M. Payen gives the proportional quantities of the different substances which he finds in raw coffee as follows:—

Cellular tissue	34.070	Nitrogenous portion . . .	3.000
Hygroscopic water	12.000	Free caffeine	0.800
Fats	10. to 13.000	Thick insoluble ethereal oil .	0.001
Starch, sugar, dextrin, and vegetable acids	15.000	Aromatic oil	0.002
Legumin	1.000	Mineral constituents; potash, lime, magnesia, phosphorus, sulphur, silica, and traces of chlorine	6.697
Chlorogenate of potash and caffeine	3.500		

Payen's chlorogenic acid is the same as the caffeic acid of Rochleder and Pfaff. Payen believed that he had obtained from coffee a crystalline double salt of this acid, containing potash and caffeine; but this observation has not been confirmed.

The proportion of fat in the coffee-bean is remarkably high, being generally stated at ten or about ten per cent. We found at least 8.9 per cent. of fat readily extracted by ether. In chicory the proportion of natural fat is scarcely appreciable; but it is brought up by the fat added in the process of roasting the chicory.

10. Some uncertainty existing respecting the proportion of the active principle, caffeine, in coffee, the point was particularly inquired into. The following process was adopted:—The raw coffee was ground fine, having been previously well dried at 212° to facilitate that operation. A decoction was then made of 1000 grains, by the repeated application of boiling water, so as to exhaust the coffee of all soluble matter. The solution was concentrated a little by evaporation. The acid of the coffee, and certain other substances, were now entirely precipitated by the addition, first, of the neutral acetate of lead, and then of the subacetate of lead. These insoluble matters were removed from the liquid by filtration. The excess of lead in solution was then thrown down by means of hydrosulphuric acid.

The liquid, after this preparation, was evaporated to dryness, and the dry matter left was exhausted by means of strong spirit of wine (sp. gr. 0.840). The alcoholic solution was concentrated by evaporation, and allowed to stand in a nearly syrupy state for about ten days, in order to crystallize. The crystals, which are caffeine, were collected upon a small filter, and com-

pressed powerfully to remove the mother-liquor. These crystals were re-dissolved in a small quantity of water, the solution evaporated, and crystallized anew. It gave almost nothing but caffeine, in long silky white needles, with little or no color. The proportion of caffeine, obtained in five experiments, made upon different samples of coffee, was as follows:—

Caffeine in raw coffee.

In Native Ceylon	. . . . .	0.80 per cent.
" " "	. . . . .	0.80 "
" " "	. . . . .	1.01 "
" Plantation Ceylon	. . . . .	0.54 "
" " "	. . . . .	0.83 "

The caffeine of the wild coffee appears to exceed that of the cultivated plant; the mean proportion of caffeine in Native Ceylon being 0.87 per cent., and in Plantation Ceylon 0.69 per cent.

The mean average of the whole five samples is 0.80 per cent. of caffeine. Probably the actual quantity of caffeine in the coffee-bean is from 0.75 to one per cent., allowance being made for losses in the separation.

The proportion of theine (or caffeine) in tea is considerably greater, and more easily extracted. Two pounds of fine strong Congou yielded 293 grains of theine, or 2.09 per cent.

When it is merely desired to extract caffeine from raw or roasted coffee, without reference to quantity, the general process for the extraction of organic bases by means of ether suffices. Lime is added to the infusion of coffee, which is then evaporated to dryness upon a water-bath. The extract may be divided by means of clean sand, and then agitated with ether. The caffeine crystallizes as the ether evaporates, or it may be re-dissolved in water, and crystallized again. We believe that the caffeine from ten per cent. of coffee in a mixture might be extracted in sufficient quantity for its identification by the preceding simple process. Caffeine, when once obtained, is fully recognized by its easy sublimation, and also by its action with nitric acid, in which it resembles uric acid. When the solution of caffeine in nitric acid is evaporated to dryness, and exposed to ammoniacal gas it is covered by a pink blush, like murexide.

The only substances besides coffee in which caffeine is known to exist, are tea, Paraguay tea, and a species of chocolate made from the *Guarana officinalis* or *Paullinia sorbilis*.

11. Chemists generally are disposed to refer the flavor and peculiar properties of coffee, as a beverage, more to its acid—the *caffeic acid* (particularly after that substance is modified in its properties by roasting), than to any other constituent of the seed. Rochleder considers this acid as belonging to the tannin class of substances, and calls it *tanno-caffeic acid*. But as caffeic acid does not precipitate gelatine, it is deficient in the most characteristic quality of the tannic acids. Caffeic acid, in the present state of our knowledge, appears to be confined to the coffee-plant.

We have observed a property of caffeic acid which facilitates the detection of that substance, and consequently of coffee, in a mixture. Caffeic acid appears to be analogous to kinic acid, the acid of cinchona barks, for it yields kinone when oxidated by means of sulphuric acid and binoxide of manganese. To observe this property, the coffee is boiled with water and a little slaked lime, the infusion filtered, and evaporated down to the consistence of a syrup. The syrupy liquid is then mixed in a retort with four times its weight of binoxide of manganese, and one part of oil of vitrol diluted with an equal bulk of water. Sufficient heat is produced by the action of sulphuric acid upon the other materials, to bring over the greater portion of the kinone, and the lamp need not be applied till towards the close of the operation. The distillate consists of yellow crystals of kinone, which usually coat the neck and sides of the retort, and a bright yellow liquid, which is a saturated aqueous solution of kinone, with a considerable quantity of formic acid. Kinone is easily discernible by its volatility and peculiarly acrid odor, which greatly resembles that of chlorine. The solution of kinone gives with ammonia a sepia-black color, and becomes reddish-brown with hydrosulphuric acid. It is decolorized by sulphurous acid. The beautiful green hydrokinone is obtained by exactly neutralizing the solution of the yellow kinone with sulphurous acid, great care being taken not to introduce the latter in excess.

The peculiar acid of Paraguay tea agrees with caffeic acid (to which it is no doubt related) in yielding kinone to similar oxidizing agencies; so does the acid of the leaves of common holly (*Ilex aquifolium*) tea, and the whole of the *cinchona* tribe.

The *prune* tribe of plants, including the sloe, cherry, laurel, &c., the seeds of which yield prussic acid, all contain amygdalin, or some similar principle. Now all of these, when oxidized in the same manner as the former class, yield oil of bitter almonds, and so can be recognized.

The *willow* and *poplar* tribe, on the other hand, yield oil of *Spirea ulmaria* (salicylous acid), a very characteristic substance.

The tests for kinone can be applied in a few minutes, and they are sufficient to indicate the presence of ten or twelve per cent. of coffee in a mixture.

12. The root of *chicory* presents no feature of a marked nature, beyond its large proportion of sugar and the composition of its ash, which have both been sufficiently adverted to. The proportion of fat naturally in the root, is quite insignificant. In an infusion of the fresh undried root, neutral acetate of lead appears to throw down the whole acids of chicory, and the subacetate of lead produces no further precipitate in the liquid. But the root appears to undergo a considerable modification by being dried at a temperature not exceeding 212° . Its infusion now gives a second precipitate with subacetate of lead following the neutral acetate. Both of these precipitates can be well enough washed; but when the attempt was made to decompose either of them by means of hydrosulphuric acid, a mucila-

ginous liquid was obtained, from which the sulphide of lead does not fall, unless with a considerable addition of alcohol. The acid precipitates appear most indeterminate, and afford nothing crystalline. A great deal of pectin-looking substance is present. Chicory also appears to possess about one-fourth of the quantity of inulin that is contained in the dried root, and starch in no other form, the infusion of chicory giving only a brown with iodine, and no blue. Chicory appears to contain no oxalic, malic, citric, or any other crystallizable organic acid. The other sweet roots, beets, turnips, &c., also, like chicory, present little that is tangible in their chemical properties. But the dark color of the infusions of all these roots when roasted, the great density of their solutions, and their fermentability, afford sufficient means for distinguishing them from coffee, and for discovering their admixture with that substance.

The properties of a great variety of other vegetable substances, which might possibly be employed in the adulteration of coffee, are exhibited in the early tables of this Report.

The Gums and Resins of Commerce. By P. L. SIMMONDS.

(Continued from page 230.)

EAST INDIAN GUM KINO.—This, one of the most useful indigenous gum resins of the East, is the produce of the *Pterocarpus marsupium*, Roxburgh. The gum flows out on longitudinal incisions being made in the bark, which being fleshy and very thick, is easily done. It trickles down in a tenacious semi-fluid form, and is collected in a cocoa nut shell. On exposure to the sun in flat plates, it soon hardens into angular brittle shining fragments, of a bright ruby color, highly astringent, and readily soluble in hot water. The gum changes into a blood red color by alkalies, which, however, destroy its astringent properties. It is precipitated by the salts of iron, silver, lead, &c., and, with sulphate of iron forms a fine ink. It dissolves readily in water, to which it imparts its own beautiful color.

Another variety of Indian kino exudes during the hot weather from natural fissures and wounds in the bark of the *Butea frondosa*, a very common leguminous tree. It is known in commerce by the name of Bengal kino, or gum butea, being closely allied to the kino of *Pterocarpus*, in its chemical and medicinal properties. The natives of India use it for tanning, but as it imparts to the leather a red color, it is considered objectionable by European tanners. Kino is commonly used in medicine for its astringent properties, especially in diarrhoea, chronic dysentery, and other such cases.

AMBER.—The source of amber was long uncertain; by some it was considered a carbonaceous mineral, but it is now universally supposed to be a vegetable resin, the product probably of a *Pinus*. It is too well known in pearance to need description. It has several commercial uses. Being commonly translucent, and susceptible of a good polish, it is made into

ornaments as necklaces. It is the base of an excellent varnish, and the source of succinic acid, which is employed in chemical investigations. The beautiful black varnish used by coach-makers, is a very carefully prepared compound of amber, asphaltum, linseed oil, and oil of turpentine. Amber often contains insects, flies, ants, spiders, &c., some of which are so delicately formed that they could not have occurred except in a fluid mass, such as a volatile oil or natural balsam. Mr. Wallis, of Longacre, has one of the largest and most interesting collections of these fossil insects I remember to have seen, and they occur not only in amber, but occasionally in the courbaril resin of South America, in copal and anime, and in copal from Accra. In its appearance and physical properties, amber strongly resembles copal, which is often fraudulently sold for it in the Indian bazaars.

We derive our chief supplies from Prussia, where it is thrown up on the coast between Königsberg and Memel. The imports in the last few years have averaged about 40 cwts. yearly. Large deposits of amber were found a few years ago in some lakes on the eastern coast of Courland, not far from the Gulf of Riga; and in January, 1854, a bed of yellow amber, apparently of great extent, was found on sinking a well at Prague, from which pieces weighing two and three pounds were extracted. The largest block known is in the Royal Cabinet at Berlin, and weighs thirteen pounds.

This fossil is also found in Madagascar, in Japan, on the shores of the Indian Archipelago, and in small quantities on the coast of China. It forms a considerable item of import in the Chinese ports, the greater portion coming from the eastern coast of Africa; its value there formerly was very great as an incense and for ornaments. Transparent yellow pieces are considered the best, and the price in the East, as here, varies according to size and quality; for its color ranges from black and yellow through red and white. A resin called false amber—no doubt a copal—is among the exports from Calcutta to Great Britain to the extent of several tons.

LAC—This important resinous substance, which comes into our ports from the East Indies in various forms, to the extent now of 2500 tons per annum, is obtained from the incrustations made by an insect (*coccus lacca*), similar to the cochineal insect on the branches and twigs of many trees in India, as *Vatica laccifera*, *Butea Frondosa*, *Inga dulcis*, *Feronia elephantum*, *Erythrina indica*, *Schleichera trijuga*, &c. The lac is formed by the insect into cells, somewhat resembling a honeycomb, in which the insect is generally found entire, and owing to whose presence stick lac yields by proper treatment a red dye, nearly, if not quite, as bright as that obtained from cochineal, and more permanent.

Lac is found encircling the branches of these trees in the form of a tube, (half an inch to one inch in diameter,) the broken branches, with incrustation at various distances, is called in commerce stick lac, which ought to be semi-transparent. The coloring matter, exhibited by grinding stick

lac, and then treating it with water, constitutes seed lac. I have on the table specimens in the various forms, of the crude stick lac attached to branches of various trees, seed lac, lump lac, shellac, thin plates of a yellowish and brown color, known as button lac, thread lac, and bleached or white lac of the shops.

The range of production of this resin is very extended, reaching from Bombay to the Eastern Archipelago, Ganjam, Nepaul, Burmah, the jungles of the Malay Peninsula, and those of Southern India. In the latter district it is not much collected for commercial purposes, although always procurable in the bazaars. The best lac is produced there upon the *Schleichera trijuga*, or corumb tree, which abounds in the Central Provinces, and yields the coloring matter twice a year. Burt lac is produced in the Rajpootana States, on the *Fiscus indica* and *religiosa*, *Zizyphus jujuba*, and *Acacia concinna*.

The resin in stick lac constitutes about 68 per cent.; in seed lac 88 per cent.; and in shellac 91 per cent. The wax, which forms about 5 or 6 per cent., is analogous to myrtle wax.

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Editorial Department.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The attention of our readers is directed to the call of the President of the Association, at page 370, which explains the object of the Institution, and the conditions of membership. Like the Medical Association, it has been instituted to promote the professional interests of the body by elevating the individual, inviting each well disposed pharmacist and druggist to partake in its advantages and usefulness. Now by this we do not mean that an apothecary, by being a member, will add a certain number of dollars to his income,—possibly it may not increase it a dime. But we do mean that it will open a field wherein he can glean much that may be improving to himself, and at the same time, without loss, enable him to extend a useful influence to others less enlightened and successful than himself. The tendency of the Association is opposed to concentrating business and knowledge in the hands of a few—its aim is to aid all earnest members of our profession to raise their standard of practice by personal exertions, to disseminate information, and to encourage correct practice among all. Freed as it thus is of all exclusive pretensions, it merits general support, to enable it to extend the full amount of usefulness it is capable of doing. Already its "Proceedings" have furnished valuable and interesting papers, quoted in our own and European Journals, and this feature is but just budding, having only commenced last year. We have reason to believe that the ensuing meeting will be marked with great interest in this regard, from the number

of subjects portioned out to Committees for investigation. The gentlemen who voluntarily undertook the labor of research, will doubtless feel an honorable desire to accomplish their several investigations in good time, so as to avoid the necessity of so humiliating a report as is exhibited in the proceedings of the Medical Association at Nashville, in May last, wherein three-fourths of the reports were either not received, or the Committee asked for more time. The members and others who may not have received a copy of the Proceedings, will find a list of those Committees and their subjects in the November number of this Journal for 1856.

The Philadelphia College of Pharmacy are taking measures to accommodate the Association in their Hall, where there will be ample room for the display of any specimens or other objects of interest the members and new comers may bring. It is particularly desirable that every gentlemen proposing to attend, should, before leaving home, ask himself if there is anything that he can contribute to the interest of the meeting; either in the form of a paper on any subject appropriate to the occasion, or of specimens of pharmaceutical preparations, rare drugs, etc. In Cincinnati, in Baltimore, in Detroit, in Boston, in New York, in New Orleans and Richmond, there are doubtless preparations known only in those places, and which are there highly esteemed, and which the pharmacutists of those places would gladly see in the Pharmacopœia. Let the gentlemen from those places bring specimens of them to the meeting; and let all see them and compare them; and if it should be decided to appoint a committee in reference to the next revision of the Pharmacopœia in 1860, this committee will properly take them in hand and report on them next year.

From accidental causes Philadelphia has heretofore had a prevailing influence in the construction and remodeling of our National Medical Codex, and by some the work has been thought too local in its character. If this has been the case, it has not been by design, and the proper way to remedy it is, for the physicians and pharmacutists of all sections to do their share of the preparatory labor, that the revising committee, when appointed at Washington in 1860, will know what the profession needs.

In concluding, we would suggest to the many pharmacutists and druggists who come to this city and New York from the South and West on business, that they keep in view the time of the meeting of the Association (Sept. 8th), and arrange their plans so as to be in attendance.

The Plant, an illustration of the Organic Life of the Animal. By HARLAND COULTAS, author of "the Principles of Botany as exemplified in the Cryptogamia, etc." Philadelphia. Perry & Errety, publishers. 1855. Pp. 180, 12mo.

The object of the author in the publication of this volume appears to be to claim more consideration for Botany as a branch of scientific education, but more especially of medical education, as he believes the great advance

made recently in the study of animal physiology to be chiefly due to the initiative researches and discoveries in the functions of vegetable life by Mirbel, Mohl, Schleiden, and others, by which the cell origin of animal structure has been demonstrated. We agree entirely with the author in regard to the unmerited neglect of botanical studies by medical, as well as pharmaceutical students, to whom it is more *necessary* than to any other classes of community. It is, perhaps, not easy to give the true causes for this neglect; yet among them is the prevailing disposition in our schools to *facilitate* the process of obtaining diplomas by *simplifying* the curriculum to meet the convenience of imperfect scholarship. So palpable is the neglect of even structural botany among medical students, that a professor of materia medica who enters with any minuteness into the description of medical plants, is too frequently voted a *bore*, and his lessons thrown away. Another cause, perhaps, is the lack of able teachers to win the student in spite of his disinclination for the science. Let our institutions place botany beside chemistry as a collateral branch of medical instruction, and we have the remedy.

Investigations, Chemical and Physiological, relative to certain American Vertebrata. By JOSEPH JONES, M. D., Professor of Chemistry in the Savannah Medical College. Washington City. Published by the Smithsonian Institution, July, 1856. New York; G. P. Putnam & Co. Pp. 137, quarto. From the Author.

This work has evidently involved a large amount of labor and research which nothing but true love of science could have stimulated and sustained. In the several chapters the author has studied, 1st, method of analyzing the blood. 2d, the blood of vertebrate animals in its normal condition. 3d, physical and chemical changes of the solids and fluids of animals when deprived of food and drinks. 4th, effects of starvation and thirst, combined with a change of diet upon the fluids and solids of carnivorous chelonians. 5th, observations upon the alimentary canal, and digestion of albumen and flesh. The remaining five chapters are severally on the pancreas, liver, spleen, kidney and urine of cold-blooded animals.

Drs. Samuel Jackson, Joseph Leidy and Jeffries Wyman constitute the the Commission to whom the work was referred for examination by the Smithsonian Institution.

Valedictory Address to the Graduates of the Maryland College of Pharmacy, delivered March 6th, 1857. By CHARLES FRICK, M. D. With a list of the Graduates. Published by the Trustees of the College. Baltimore, 1857; pp. 25, octavo.

The tone of Dr. Frick's address is excellent, and its style unexceptionable. We congratulate our Baltimore brethren on their possession of so able and accomplished a teacher.

Rapport a l'académie Impériale de Reims sur l'introduction, et la culture du Pin noir d'Autriche dans les plaines stériles de la Champagne; par M. Le Docteur LEUCHSENRING, membre correspondant. Reims, Aout 1855. Pp. 28, octavo.

This pamphlet is on the introduction of the Black Pine of Austria as a forest tree into Champagne, France, where much sterile soil suited to its growth exists. Much more attention is devoted to arbor-culture in Europe, where the primitive forests have to a much greater extent disappeared before the wants of society, than in this country. About a century ago the Larch was extensively introduced into the Scottish Highlands by the Duke of Athol, and his descendants at this day reap a large income from the timber yielded by the forests thus begun. It is quite time that some of our own political economists should direct public attention to, and demonstrate the feasibility and importance of, planting forest trees of native and foreign varieties of value. Already the destruction of timber on our mountains and highlands is modifying the condensing power of those primal sources of rivers, and deteriorating the value of the latter as highways of traffic.

OBITUARY.—Within the past year death has been busy among men eminent in science, and it is right to place a record of his doings on our pages, devoted though they be to but one department of knowledge.

JOHN AYRTON PARIS. This excellent and distinguished man died at his residence in London on the 24th of December, 1856, in the seventy-second year of his age, having been at born at Cambridge on the 7th of August, 1785. Dr. Paris commenced the study of his profession when but fourteen years old, and manifested great zeal in its pursuit; he graduated early at Caius College, Cambridge, and afterwards studied at Edinburgh. He was elected Physician to the Westminster Hospital at twenty-two, but soon resigned the appointment and moved to Penzance, in Cornwall. Whilst residing here he founded the Royal Geological Society of Cornwall, and gave to the Cornish miner a great boon in the "Tamping-bar," an instrument by which he is able to pursue his business among inflammable gases without fear of striking fire from the rock. In 1810 he returned to London, and then continued the practice of medicine until two weeks before his death. He was elected President of the London College of Physicians in 1844, which distinguished position he held till death. His abilities as a physician were of the highest order, and his literary attainments quite remarkable. "The Life of *Sir Humphrey Davy* will ever remain one of the classical biographies of the English language." The Pharmaceutist knows him chiefly through his *Pharmacologia* and his "*Medical Chemistry*." Besides these he wrote works on *Diet*, *Medical Jurisprudence*, and on "*Philosophy in Sport*." He suffered much a few days previous to his decease, but retained his intellect clear and bright while speech remained.

HUGH MILLER.—On the same day with Dr. Paris, (Dec. 24, 1856,) but

under very different circumstances, Scotland lost one of her brightest sons. Hugh Miller, who from the humble ranks of the quarry men, rose to an eminent position among British geologists, and who has done so much to "popularize and Christianize science," whilst under the influence of an overwrought brain, died by his own hand. Though possessed of a strong frame and large brain, they were insufficient to meet the exorbitant demands of an unceasing application. For some time before his death his nervous system gave indications of disorder, and had he been as familiar with its workings as with those strata whose history he has written with so much power, he would have perhaps avoided the sad catastrophe which terminated at once his labors and his life. During his latter days he became possessed with the idea that his museum would be robbed, and provided fire arms to repel intruders; horrible dreams disturbed his rest, and inability to get refreshing sleep became at last a source of serious anxiety, and concentrated in self-destruction.—(*Silliman.*)

His works, "Foot-prints of the Creator, or the Asterolepis of Stromness," and "My Schools and Schoolmasters," are well known, and he had just completed his "Testimony of the Rocks" the day before his death.

DR. ANDREW URE, so long and favorably known in connection with technical chemistry, died on the 2d of January, 1857, after a short illness, at the age of seventy-eight. Dr. Ure was born in Glasgow in 1778, and studied in its University. He afterwards studied in Edinburgh and graduated in medicine at his native city in 1801. In 1804 he was appointed Andersonian Professor of Chemistry and Physics in Glasgow. In 1809 he was attached to the newly established Glasgow Observatory, where he remained several years. A series of valuable papers in the Journals marked his progress from year to year. In 1818 he described the Eudiometer which bears his name. In 1821 his "Dictionary of Chemistry" was published. In 1830 Dr. Ure became a resident of London, and was appointed chemist to the Board of Customs in 1834. In 1835 he published "The Philosophy of Manufactures," and in the next year "The Cotton Manufacture of Great Britain." His celebrated "Dictionary of Arts, Manufactures and Mines" was first published in 1837, and by it he is most extensively known in this country from an American reprint. This great work has gone through several editions.

Possessed of indefatigable industry and enthusiastic love of his scientific labor, Dr. Ure accomplished an amount of results surprising to an ordinary mind. He was consulted extensively by manufacturers in the adaptation of processes and machinery to scientific principles, and from the observations accumulating from this source no doubt arose his great Dictionary of Arts, &c.

Although his health was failing during his three or four last years, his faculties were bright and his scientific pursuits were kept up until within a few days of his death.

Dr. Ure was an honorary member of the Pharmaceutical Society of Great

Britain, and one of its early friends. We feel it but justice to use the language of Mr. Bell (from whose obituary notice in the *Pharmaceutical Journal* the above facts are chiefly taken) in relation to this fact. "Among the scientific men who gave their countenance and encouragement to the Pharmaceutical Society at its establishment in 1841, the name of Dr. Ure is gratefully remembered. At that time the business of a chemist and druggist was only recognized as a respectable trade, and the endeavor to invest it with anything like a professional character by the establishment of a regular pharmaceutical qualification was considered by most persons a chimerical project. At that critical period, the sanction, and presence at the meetings, of men enjoying a high position in chemistry and the sciences, had a very encouraging influence on the prospects of the new Society.

"Several of the 'friends in need,' who in considerable numbers thus came forward as its promoters, have passed away, and have been noticed with regret in our obituary. We have now to offer a sincere tribute to Dr. Ure, to whom we are indebted not only for his frequent attendance at our early meetings, but for interesting lectures delivered to the members, and papers which have appeared in the *Transactions* of the Society."

WILLIAM C. REDFIELD, favorably known in the United States for his meteorological and geological researches, died in New York on the 12th of February, at the age of sixty-eight. Mr. Redfield's theory of storms, broached in 1831, has gained many advocates, and with his other labors has given him a prominent place among modern meteorologists, especially as his discoveries are of much practical importance to the navigator.

JACOB W. BAILEY, professor of chemistry, mineralogy and geology at the U. S. Military Academy at West Point, died on the 26th of February last of consumption.

Prof. Bailey devoted his leisure chiefly to microscopic research, in which direction he has done much more than any other American, and his labors have won him a position among microscopists deservedly high. Those who knew him describe his life as being "without reproach, his gentleness and modesty, his earnestness for truth rather than self, his untiring energy even when his physical system seemed to be dissolving away from his spirit, make a character that excites love as well as admiration."—(Silliman).

PROF. M. TUOMEY, an eminent geologist of the Southern States, died at Tuscaloosa, Alabama, on the 30th of March last. He accomplished the geological survey of South Carolina, and was engaged in that of Alabama at the time of his death, and was also in the Chair of Geology in the University of Alabama at Tuscaloosa.

PROF. JOHN LOCKE, of Cincinnati, died on the 10th of July, 1856, in the 65th year of his age. Prof. Locke, though a teacher of chemistry, devoted much of his time to researches on subjects of general science, especially electro-magnetism, and claimed to be the discoverer or inventor of the electro-chronograph.

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SEPTEMBER, 1857.  
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HYDRARGYRUM CUM CRETA, AND PILULÆ HYDRARGYRI.

By EDWARD R. SQUIBB, M. D., U. S. Navy.

Assistant Director U. S. Naval Laboratory, New York.

THESE mercurial preparations which are so valuable in consequence of their gentle, mild and manageable action, depend for their characteristic qualities upon the form in which the mercury is contained in them, and the preparations are mild and manageable just in proportion as the metal is properly comminuted, and free from oxidation.

It is quite common to hear physicians complain that they have been forced, within a few years past, to abandon the use of mercury with chalk, because it so commonly excites vomiting and gastro enteritic irritation; whereas, in the practice that has come under the personal observation of the writer, the preparation of the Pharmacopœia has never produced any such effects. The writer has therefore long coincided in the belief that these bad effects are due to the oxidation of the mercury in the short and faulty processes often adopted in preparing the medicine.

In a paper from the Editor of this Journal (Vol. 22, pp. 113. et seq.,) it was pretty clearly shown that such conclusions were correct and reasonable; and it then only remained to be determined whether these labor-saving processes were the only causes of oxidation; and to obtain some easy practical method of ascertaining the condition and quality of any given sample.

In the preparation of mercury with chalk, there are two opposite conditions equally to be avoided. When the trituration is in sufficient there is no oxidation, but the mercury remains in almost its original inert condition, although the globules may not be visible to ordinary observation even with a lens. The

surfaces of the globules become covered and hidden by the fine powder of chalk, so that though large, they are not easily seen. Such specimens, unless artificially colored, are of a very light color, and upon admixture with water afford in a moment a nearly white mixture, from the rapid subsidence of the mercury.

On the other hand, when the trituration is too long continued, the mercury becomes too finely divided, and in this condition oxidizes too rapidly and too readily, as well in the *primæ viæ* when administered, as during the process of preparation and in the keeping. In the trituration of the materials in the ordinary way no appreciable oxidation occurs until the globules become too small to be seen by the naked eye. But after this point has been passed, the rate of oxidation increases rapidly as the mercury becomes more and more divided, until finally it may be in large proportion converted into sub-oxide by oxidation from the air. The art of making a good preparation, therefore, consists in excluding the air wholly or partially during the process, and in arresting the trituration at the proper time. Very finely divided mercury oxidizes and dissolves very easily, becoming first a sub-oxide, whilst this sub-oxide in its turn is still more easily converted into per-oxide and metallic mercury. Thus the sub-oxide, which, under ordinary circumstances is among the mildest of mercurial compounds, from the instability of its chemical character is very likely to react with the vitiated secretions of cholera infantum, &c., just as Mialhe has shown that calomel sometimes does, and thus be easily converted into per-oxide and per-chloride. That this is the proper explanation of the undue activity of some samples of this preparation, is rendered almost certain by the writers' observations of the similar changes that spontaneously occur when such specimens are long kept with free access of light and air. Thus, a specimen prepared almost without contact of air, was of a very dark color, and nearly free from oxidation. At the end of a year's exposure to light in a loosely stopped bottle, it was found to contain both oxides in very notable proportion. Another portion prepared by trituration with steam power for two days and a half, by a good mechanical arrangement, but without any attempt at excluding the air, was found at the end of the trituration to contain a notable proportion of sub-oxide, but no per-oxide.

A specimen of this, which has been kept in a tall slender loosely stopped bottle of white glass, for two years and four months, now yields upon analysis a large proportion of both oxides. (See 6th analysis below.) This preparation, in its present condition, when administered to adult men in ordinary doses, still retains its proper mild character to such a degree that its action would not attract ordinary attention. But in the cases of children, especially in that class of diseases in which it is commonly prescribed, it is found to be rather too active for the indications to its use, though it does not produce vomiting at all. It is, nevertheless, undoubtedly a bad preparation, through too long trituration and bad keeping, but serves its purpose of clearly exhibiting the necessity for close attention and accurate observation in the process of preparation.

The best process for Hydrargyrum Cum Creta, as far as the writers' experience goes, is as follows:—

Introduce the mercury with a portion of the chalk into a strong bottle of double the capacity required, and shake the mixture actively as originally proposed to Dr. Coxe of New Orleans, by Mr. W. Hewson of Augusta, Ga. (See *Am. Jour. Pharmacy*, vol. 22. pp. 316 et seq.) When upon a smooth compressed surface of the powder, the mercury is no longer visible to the naked eye, it is to be well triturated with the remainder of the chalk until a fine smooth grey powder is obtained. It is then immediately put up in small vials to be well secluded from light and air.

From the fact that very few pharmacutists make these preparations, it becomes much more important to have a means of testing the character of those of the common market upon which they depend for supply, and therefore the writer has been at some pains to fix upon the following practical easy tests, which he believes to be capable of general and indiscriminate application, at the same time that they are reliable within practical limits.

The powder should be of a fine clear deep grey color, rather of the lively silver tinge, than of the dull leaden color. It should be entirely free from any rose, or "ashes of roses" tint;—and the powder should be a little cumulative or clammy, and not at all mobile or sabulous.

A little heap of it, pressed upon a dark surface with a smooth

spatula, should present no globules of mercury visible to the naked eye, and but few that are visible with an ordinary pocket lens, though looked at in all the various directions of a good light.

A small portion of the powder shaken in a test tube with a large portion of water, and then allowed to stand for half an hour, with close observation, will afford some very clear indications of quality. If the mercury is in large globules it will subside at once, and leave the chalk almost alone in suspension. This chalk then more slowly subsides and forms a stratum, the color of which indicates the proportion of mercury that may have been either finely divided or oxidized. In other cases several distinct strata may be observed, from the silvery grey of the larger globules at the bottom to the black layer of light fine oxide on top. The smaller the silvery stratum at the bottom, and the larger and more uniform the central leaden grey stratum is, the better the preparation. It is not easy to describe the indications and appearances of this simple test, but any one who will practice it two or three times will be convinced of its utility. The uniformity with which the mercury is divided, and the extent to which the trituration has been carried are best exhibited by this test.

A portion of the powder treated with dilute acetic acid in excess till all the carbonate of lime is decomposed, is then boiled, and the clear solution separated from the residue by filtration. The acetic acid dissolves both oxides of mercury and holds them in acid solution. If now a few drops of hydrochloric acid be added to the clear cold filtrate, it will decompose whatever mercurial salts are present and form corresponding chlorides with the bases. The sub-chloride being insoluble is at once precipitated, and from the quantity of this precipitate the quantity of sub-oxide is judged of. No well prepared specimen of mercury with chalk, unless all contact of air has been avoided, is ever found absolutely free from sub-oxide by this test.

Specimens badly prepared in one direction are often found entirely free from suboxide, (or other oxide,) whilst if badly prepared in the other direction, or if long kept with exposure to light or air, the precipitate with hydrochloric acid is not a mere opalescent milkiness, but it renders the liquid white and

opaque, and within a few minutes begins to subside and collect at the bottom of the test glass.

After precipitating all the suboxide as subchloride the precipitate is filtered out, and the filtrate is tested by adding ammonia in slight excess. If there has been any persalt of mercury in the original solution it will have been changed by the HCl. into soluble perchloride, and in this condition will have passed the filter. The ammonia precipitates this salt as ammoniated mercury or "white precipitate," and the proportion of this second white precipitate is indicative of the amount of peroxide in the preparation.

Now it happens that acetic acid, as well as hydrochloric, although without any appreciable action upon fluid metallic mercury, does act upon the metallic mercury in the state of subdivision in which it exists in well made mercury with chalk; but the amount oxidized and dissolved by acetic acid under the conditions of this test, is so small that it may be disregarded in the practical application of the test. It is certain, too, that in the process of dissolving the suboxide in the acetic acid, particularly in boiling the mixture, a small portion of the suboxide is decomposed into metallic mercury and peroxide, so that when the original proportion of suboxide is very small, and peroxide altogether wanting, yet the testing may indicate the presence of peroxide without any suboxide, from this cause,—a circumstance well illustrated in the third and fourth analyses, given below.

All the writer's experiments and observations, however, go to establish the fact that peroxide never occurs in these preparations, except through the condition of suboxidation as an intermediate step. The mercury is first suboxidized by the action of light and air upon it in its state of minute division, and the suboxide is then changed to peroxide by access of light and air.

The residue left undissolved by the acetic acid consists of the mercury, the insoluble impurities of the chalk, and any earthy coloring matters that may have been used. In one of the samples examined—the fifth—a large proportion of the insoluble matter looked very much like old phosphate of iron. Evaporation of the mercury from this residue at the lowest practicable temperature, from a watch glass, leaves the fixed residue to be judged by its character and proportion.

By using a weighed quantity of the powder, and by weighing the dried precipitates as subchloride, and sulphide, (rather than as ammoniated mercury,) and by distilling the mercury from the residue into alcohol, and drying and weighing it, this process is readily converted into a practically sufficient quantitative analysis. This is the method adopted in the examination of the following specimens of Hydrarg. cum Creta.

Five of the specimens were purchased at respectable central prescription stores, and the sixth is the specimen mentioned above, as having been exposed to light and air during twenty-eight months, in a narrow vial, after prolonged trituration.

The product of the officinal formula yields on analysis not 37.5 per cent. of mercury, as it should do in theory, but only about 36.9 per cent. or .6 per cent. minus. This deficiency is probably due to evaporation during the process.

S A M P L E .	P E R C E N T A G E O F					
	Hg.	Hg ₂ O.	Hg O.	Ca O, CO ₂	Insoluble matter.	Deficiency in Hg.
1st. Color and appearance good, - - -	32.07	0.08	0.20	63.29	4.36	14.50
2d. Color and appearance good, - - -	35.52	0.33	0.21	63.94	traces	5.30
3d. Color and appearance pretty good, -	35.44		0.05	54.79	9.72	5.5
4th. Color very light, large globules visible,	37.42		0.12	56.49	6.67	0.21
5th. Color light, greenish tinge, - - - -	28.08	0.13	0.22	60.55	11.02	25.13
6th. Color very dark, appearance good, -	34.2	1.21	1.44	63.15	traces	

The result of these examinations does not justify the conclusions at which the writer had arrived, nor does it explain the cause of the complaints so generally made by physicians, since that sample which contained most of both oxides failed to produce the bad effects complained of. The proportion in this sample is still very small, however, and nothing like what other observers have found; and, therefore, as these six specimens can scarcely represent the market upon which the complaints

are based, the writer's opinion and conclusions are in no degree changed as to the true cause of complaint being oxidation of the metal, although the examination has unexpectedly failed to establish the fact.

Six specimens of *Pilulæ Hydrargyri* were also examined qualitatively for oxides of mercury, and quantitatively for mercury, with the following results.

S A M P L E .	P E R C E N T A G E O F			
	Hg.	Hg ₂ O.	Hg O.	Deficient in Hg.
1st. Olive color, good consistence,	30.3	traces,	traces,	9.01
2d. Good color and consistence,	33.4			
3d. Olive color, too stiff, - - -	29.1	notable proportion		13.7
4th. " " good consistence,	33.	notable proportion		1.
5th. Good color and consistence,	32.8	notable proportion		1.29
6th. Standard Laboratory prep. -	33.4			

These specimens are from the same sources as the *Hydrarg. cum Creta*; and from their examination it appears that when well made this preparation loses no mercury, neither does it oxidize any portion of it.

Whether the new form in which it is now coming into use, namely, that of "Powdered Blue Mass," will not impair its value, by subjecting it to greater risk of oxidation, is a question worthy of inquiry. The reasons for its use in such a form are stated to be its greater efficiency and certainty. If it be either more efficient or certain in this form, the circumstance may probably be explained by the fact of its being too often found materially deficient in both the quantity of mercury, and method of preparation.

NAVAL LABORATORY, New York, August, 1857.

THE ACTION OF THE ALKALINE CHLORIDES ON CALOMEL.

By ANDREW FLEMING, M. D.

The question, is calomel when combined with the chlorides of the alkalies converted wholly or in part into corrosive sublimate, changing the mild purgative into a very powerful preparation,

has occupied the attention of some few of the profession for a considerable length of time, dating, perhaps from the year 1763, "when Capallo first observed the danger arising from a mixture of calomel and sal-ammoniac."

Among those of modern date who assert that this change does take place, is found the name of Koffer, a German, who holds that he has been able to detect the alteration, and even more prominent, confirming his opinion, that of M. Mialhe, who communicated through the *Journal de Pharmacie* for February, 1840, experiments and results verifying his assertion. These experiments were conducted in the following manner: 1. 1000 parts of distilled water, 60 of common salt, 60 of sal-ammoniac, and 60 of calomel (prepared by sublimation,) which had been perfectly washed, were mixed and allowed to react for twenty-four hours, the temperature varying from 68° to 77° Fahrenheit; there was produced 0.6 of a part of corrosive sublimate. Similar experiments were made with calomel, prepared by precipitation with precisely similar results. 2. 1000 parts of the assay liquor (the alkaline chlorides just enumerated) had 60 parts of calomel, (*à la vapeur*) digested in it for twenty-four hours, at a temperature varying from 104° to 128° Fahr., and 1.5 of corrosive sublimate was produced.

A majority of medical practitioners rely upon the opinion of these gentlemen, in refusing to employ these substances in conjunction, and the authors of the different tables of incompatibles endorse their statement by directing that they ought not to be united in prescription.

Opposed to popular belief and the results of the above experiments we find that Dr. Gardner denies the assertion of M. Mialhe, that calomel is converted into corrosive sublimate by the chlorides of the alkalis, maintaining that it is merely rendered soluble by their solutions. Lepage and D'Ollegio, an Italian chemist, each from experiments made separately, also contradict the opinion of M. Mialhe, and hold: 1. That calomel when perfectly free from sublimate, digested with its own weight of hydrochlorate of ammonia, or any other alkaline chloride, in distilled water, at a temperature of from 100° to 104° of Fahrenheit, during twenty-four, thirty-six or even forty-eight hours, underwent no change of color. The filtered liquor did

not, by means of any reagent, appear to contain a trace of a mercurial salt. Some pigeons, which were made to drink of this same liquor for several successive days, suffered no inconvenience, and the calomel lost no sensible weight.

2. The same mixture exposed to a temperature of 122° to 140° Fahr., yielded a liquor which acted precisely in the same way with reagents, and on the animal economy, as the foregoing.

The results of the last mentioned experiments, while they seem to support the belief of Dr. Gardner, refute his idea, "that calomel is merely rendered soluble" by the solution of the chlorides, for if the calomel had become *soluble* by their presence, then would it have lost in weight.

The difficulty that now arises in the mind, is to know which of these assertions we are to believe, and on which of the two opinions can we rely. In conclusions so directly opposite there must be a right and wrong way, or some undiscovered cause to explain such a difference of result. In this dilemma, being desirous of possessing positive information, and without any prejudice in favor of either opinion, we resolved to examine the subject critically.

After careful trial with the formula given by M. Mialhe, we have been able to detect corrosive sublimate, in the filtered liquor, though in quantity exceedingly minute. With close observation we found that, owing to the chlorides being in so large a proportion, the precipitate yielded by some of the reagents was modified, tending to make its presence more doubtful.

Not content with this, and more thoroughly to avoid deception, we performed the following experiments viz. 1. Water two drachms, calomel (hydro-sublimed and perfectly washed) 10 grains. 2. Water two drachms, calomel 10 grains, and hydrochlorate of ammonia 60 grains. Each of these portions, was placed in shallow porcelain saucers, and allowed to remain for twenty-four hours, at the temperature of the atmosphere, ranging from 70° to 80° Fahrenheit. On examination, after the above space of time had elapsed, (evaporation having taken place to some extent,) there was found, in each instance, on the sides of the vessels, a nearly unbroken circle of pure white crystals, which, on carefully applying the test (a strong solution of iodide of potassium) in small quantity, gave unmistakable evidence of

the presence of corrosive sublimate. In repeating these experiments with the articles in question, in different proportions, we have been able to detect the formation of sublimate in the space of twelve hours.

It is scarcely worth while to remark that calomel of the same quantity with water only, treated under the same conditions of temperature and exposure, gave no trace of corrosive sublimate.

From the action of calomel and hydrochlorate of ammonia, under a great variety of circumstances, we have found that, 1. The influence of strong solar light, even at a higher temperature, impedes the formation of the bichloride. 2. When removed from solar light, elevation of temperature yielded larger quantity. 3. The quantity of sublimate produced is proportional, not to that of the calomel employed, but to that of the alkaline chlorides, thereby confirming one of the results of M. Mialhe.

The facility with which the above experiments can be performed by any one but little familiar with the tests for corrosive sublimate, places within the reach of all who have a few leisure hours an opportunity to see for themselves if we are correct; or if we are in error, in what way we have made the mistake.

From what we have seen, it is easy to imagine that similar changes may sometimes take place in the human body, when these substances are exhibited as remedial agents, and for safety it would be well to avoid their combination, as others unobjectionable can be found to supply the place of either of them.

REMARKS ON THE IODINE-WATER OF DR. ANDERS.

By DR. EDWARD STIEREN.

[The following paper and annexed letter is inserted at the request of Dr. Stieren. It was written before the observations already published in the present volume on this subject. Assuming the results to be correct, they afford a subject for consideration to the analytical gentlemen who testified that the liquid in question contained only iodine and water.—ED. AMER. JOUR. PHARM.]

The writer of this first saw the above in New York and Philadelphia German newspapers of February, 1856, with the following lofty recommendation:

“Important discovery! The question of the solubility of

iodine in water has been finally settled by Dr. Henry Anders, for the benefit of mankind."

It was declared in those publications, "that Dr. Anders, after continued experiments, during a period of nine years, had at length succeeded in producing a chemical combination between pure water and iodine, without the addition of any other substance." The solubility of the iodine in water is not the discovery of Dr. Anders, it is not his merit; such was known as early as 1812, to the discoverer of the iodine, Mr. Courtois, of Paris, in France. The only question is, how much pure iodine can be dissolved in a certain quantity of pure water?

According to Gay-Lussac's experience, one part of iodine requires 7,000 parts of water for its solution; according to Jacquelin and others, 5,000 parts; and by my own experiments, made recently, I find that 5,600 parts of pure water are required for the solution of one part of pure iodine, at a temperature of from $+8$ to 12° R., equal to from $+50$ to 59° F. But Dr. Anders asserts that by his invention or discovery, a solution can be obtained containing $\frac{3}{4}$ of one grain of iodine in one ounce of water; that is, one part for only 640 parts of water, certainly a very remarkable difference between his estimate and the foregoing. There is no doubt that iodine may be dissolved in a less quantity of water than from 5,600 to 7,000 parts, provided the water contains sal ammoniac, or nitrate of ammonia, or the slightest quantity of iodide of potassium, or iodide of sodium, *etc.*, *etc.*; and further, with respect to the discovery of the French apothecary Dubauque, from 10 to 15 grains of iodine can be quickly dissolved in 10 ounces of water containing only a few grains of tannic acid. (See *Journal de Pharmacie*, Juillet, 1851, xx. 34.) This is a matter perfectly settled by different chemists.

The iodine water of Dr. Anders, in the advertisements, is announced in the most extravagant terms, as a cure for a host of diseases, at which we need not be surprised from our every day experience. The motive, of course, is evident. It is unnecessary for me to make any further remarks on this notable discovery, said to be *the greatest of the century*. The value and judicious use of iodine, in various diseases, without recourse to the pretended iodine water, is well known to enlightened physicians; it is another thing with a credulous and unscientific public.

I feel no other interest in this matter but that of science, and was curious to ascertain how this preparation would stand the chemical test of the proprietor in his advertisements, who invited chemists to decide on it, and offered to transmit samples of his iodine solution, in order that they might satisfy themselves of the justice of his pretensions. At my request, about ten ounces were sent me, in a bottle closed with a glass-stopper, with the note, that "every ounce of this aqueous solution contained $\frac{3}{4}$ of a grain of iodine."

The solution thus transmitted was of a brownish-yellow color, and had a smell of iodine. Now, as the solution of pure iodine in pure water must leave nothing, *at least no ponderable substances*, after evaporation, it was necessary to see whether it would stand this test.

a. For that purpose, two ounces of the solution were slowly and carefully evaporated to dryness in a small glass-retort; after this there remained a sediment of a grayish color. The retort was corked, and in the interim put aside with its contents.

b. Other four ounces of the iodine water were put into a small glass-retort, which was connected with a small glass recipient by a curved glass tube; the receiver contained a solution of two grains of caustic potassa in one ounce of water, in which one end of the glass pipe was immersed. After this, the contents in the retort were subjected to distillation until the liquid in the retort had entirely lost its odor. Having slowly evaporated the liquid of the recipient almost to dryness, in a silver crucible, a little powdered charcoal was then added and well mixed, and then nealed for a short time. The contents of the crucible, after cooling, treated with water, the solution obtained, filtered, and the filter welledulcorated. To this liquid, thus obtained, there was added nitric acid, very diluted, drop by drop, to neutralization, and then the iodine combination contained in the liquid decomposed by adding a solution of nitrate of silver. Afteredulcorating, exsiccating, nealing and fusing the precipitate, there was obtained two grains of iodide of silver, which is equal to 1.07736 grain of iodine, that is, 0.26934 of a grain of iodine, or a little more than $\frac{1}{4}$ of a grain to one ounce of the iodine water.

c. The sediment remaining in the retort from the evaporated

two ounces of iodine water, mentioned in experiment *b*, was treated with two drachms of water, in which it dissolved to a slightly turbid liquid; the filtered solution contained iodide of potassium.

The contents of the retort from experiment *b* being emptied into a porcelain dish, and slowly evaporated, left a grayish substance, which was soluble in alcohol at 80 per cent; the solution was somewhat turbid. The filtered spirituous solution mixed with some water, left after evaporating, three grains, which was nothing else than iodide of potassium, that is, $\frac{3}{4}$ of a grain to one ounce of the iodine water, which is equal to 0.5733 of a grain of iodine. The small remaining quantity insoluble in alcohol, contained traces of sulphuric acid, of silicic acid (silica), of lime, and of peroxide of iron.

d. Two ounces of iodine water were treated with five grains of pure caustic potassa; this solution was evaporated to dryness, and mixing a little powdered charcoal with it, was slowly nealed in a silver crucible. After cooling, the mass was treated with water, the solution being filtered; the contents of the filter, well washed, was neutralized by very diluted sulphuric acid, and then decomposed by a solution of nitrate of palladium. The iodide of palladium obtained wasedulcorated, exsiccated, then weighed $2\frac{3}{5}$ grains, which is equal to 1.69228 grain of iodine, that is, equal to 0.84614 of a grain of iodine to one ounce of iodine water. If that quantity of 0.5733 of a grain of iodine, combined with potassium in one ounce of the iodine water, is subtracted from 0.84614 of a grain, then there follows 0.27284 of a grain of free iodine. And if the average will be taken, between 0.27284 and 0.26934, accounted in experiment *b*. to one ounce of the iodine water, then there results the average of 0.27109.

According to my analysis, there is found in one ounce of the iodine water 0.27109 of a grain of *free iodine*, (something more than $\frac{1}{4}$ grain), 0.5733 of a grain of *bound iodine*, forming with 0.1779 of a grain of potassium, = 0.7512 of a grain of iodide of potassium, traces of sulphuric acid, of silicic acid (silica), of lime, and of peroxide of iron.

Tarentum, Alleghany Co., Pennsylvania.

Further remarks on "Iodine Water," by Prof. Wittstein.

(Translation.)

"Dr. Edward Stieren, of Tarentum, Pennsylvania, having sent me some of Dr. Anders' iodine water, which had been received by him of Dr. Anders himself, and asserting it to be a solution of pure iodine in 960 parts of water by weight.

A careful analysis by me, of Anders' iodine water, shows that 700 parts of the same contains 1 part of iodine; but it does not appear that this portion of iodine thus contained is entirely free, but chiefly as iodide of potassium, namely: only one-fifth of free iodine, and the other four-fifths of iodide of potassium, so that 3.500 grains of the water contains 1 grain of free iodine, and 4 grains of it are combined with potassium.

A solution of pure iodine in pure water must have no ponderable substance by evaporation; but after evaporating 670 grains of Anders' iodine water, there remained 1 grain of iodide of potassium.

According to Gay-Lussac's experience, one part of iodine required 7,000 parts of water for its solution, and according to Jacquelin's experience, 5,000 parts. According to my experiments, the last approaches nearer to the truth. I have myself found that one part of pure iodine requires 5,500 parts of pure water for its solution, at a temperature of from $+10$ to 12°C .

Any one who may wish to become acquainted with my analysis of Anders' iodine water, as also with my experiments on the solubility of iodine in pure water, is referred to page 201 a. f. of the sixth volume of my Journal of Pharmacy.

DR. G. C. WITTSTEIN,

Munich, Bavaria, Jan. 3d, 1857.

Prof. of Chemistry.

GLEANINGS—CHEMICAL, PHARMACEUTICAL AND MEDICAL.

Coffee as an Antidote.—Dr. Max. Langenschwarz, in a paper published in the American Medical Gazette, and republished in the Southern Medical and Surgical Journal, asserts that a tincture or decoction of raw or unburnt coffee "is one of the most important antidotes to many deadly poisons, and to a great many ordinary drugs." Among others, the following are noted

as being antidoted by coffee, viz.:—Opium, atropia and belladonna, aconite, strychnia, solania, veratria, oil of tansy, colocynth, conium, Rhus toxicodendron, mushrooms, cocculus Indicus, black hellebore, henbane, savin, ergot, bitter sweet, tobacco and nicotina, etc. Dr. L. says—“All the effects of these substances are almost instantly destroyed by administering what we call ‘Tincture of raw Coffee,’ or even a simple decoction of raw or green coffee, a preparation costing about nothing, and which, therefore, ought to be kept ready in every house, and in the poorest family. The following is the very simple way to get that tincture: Take a quarter of a pound of green coffee (common Domingo the best) and boil it in one quart of water till it is reduced to one pint; then put the whole (berries and liquid) in a quart bottle, add one pint of strong alcohol, and shake it from time to time a little. That’s all. This tincture gets stronger from day to day, and will, if the bottle is well corked, keep for many years without changing. If to the pint of alcohol (about ten minutes before mixing it with the coffee decoction) you add a little spirit of camphor, say two tablespoonsful, you will double and triple the anti-poisonous quality of the tincture.” Dr. Langenschwartz further says; “The compound saving-tincture (of green coffee and camphor) is in the respective cases of poisoning to be administered naturally and by clyster; the internal dose about ten to twelve drops in a teaspoonful of water every five minutes, and every fifteen minutes when the patient begins to recover. Larger, and even very large doses may be given if the danger of life is imminent.”

The author found roasted coffee in most cases without effect. Dr. L. gives no cases, all is simple assertion;—moreover, so many violent poisons, some of which are usually considered as almost without antidotes, are alleged to be wholly controlled, and several mineral poisons like potash, phosphorus, baryta, iodine, equally counteracted, that we fear he has claimed too much power and efficiency for his counter-poison. In view of the frequent accidents with the vegetable alkaloids, and especially aconite and strychnia, the suggestion of Dr. L. is well worth trying to test the reality of its alleged power.

Dr. Marshall Hall's “Ready Method.”—The instructions published by Dr. Marshall Hall for reviving asphyxiated persons

whether from drowning or other causes, has been so generally approved by the medical press that we introduce it here for the improvement of our readers :—

DR. MARSHALL HALL'S INSTRUCTIONS.—1. Treat the patient INSTANTLY, ON THE SPOT, IN THE OPEN AIR, EXPOSING the face and chest to the BREEZE (except in severe weather).

I. TO CLEAR THE THROAT.

2. Place the patient gently on the face with one WRIST under the forehead; [*all fluids and the tongue itself then fall forwards, leaving the entrance into the wind-pipe FREE.*] If there be breathing wait and WATCH; if not, or if it FAIL,—

II. TO EXCITE RESPIRATION.

3. Turn the patient well and *instantly* on his side, and—

4. Excite the nostrils with snuff, or the throat with a feather, &c., and dash cold water on the face previously rubbed warm. If there be no success, LOSE NOT A MOMENT, but INSTANTLY—

III. TO IMITATE RESPIRATION.

5. Replace the patient on his face, RAISING and supporting the chest WELL, on a folded coat or other article of dress.

6. Turn the body very GENTLY ON THE SIDE AND A LITTLE BEYOND, and then BRISKLY on the face, alternately; repeating these measures deliberately, efficiently, and perseveringly FIFTEEN times in a minute, occasionally varying the side; [*when the patient reposes on the chest, this cavity is compressed by the weight of the body, and EXPIRATION takes place; when he is turned on the side, this pressure is removed and INSPIRATION occurs*].

7. When the PRONE position is resumed, MAKE equable but efficient PRESSURE with brisk movement ALONG the back of the CHEST, removing it immediately before rotation on the side; [*the first measure augments the expiration, the second commences inspiration*].

* * THE RESULT IS—Respiration;—AND, IF NOT TOO LATE,—
* LIFE!

IV. TO INDUCE CIRCULATION AND WARMTH.

8. Meantime, rub the limbs UPWARDS, with FIRM GRASPING PRESSURE, and with ENERGY, using handkerchiefs, &c. [*By this means the blood is propelled along the veins towards the heart.*]

9. Let the limbs be thus warmed and dried, and then clothed, the bystanders supplying the requisite garments.

10. AVOID THE CONTINUOUS WARM-BATH AND THE POSITION ON OR INCLINED TO THE BACK.

Syrup of Pyrophosphate of Iron.—M. E. ROBIQUET has presented to the French Academy of Medicine, a memoir on the therapeutical employment of the pyrophosphate of iron, a condensed translation of which appeared in Hay's Journal for July, 1857. The author observes—"In medicine the essential characters of a good preparation of iron are, that it should readily dissolve in the fluids of the stomach without impairing their digestive functions, that it shall be completely assimilated in the system, and that it shall not act as an astringent. The pyrophosphate of iron possesses all these properties; its resistance to solvents is the sole difficulty which remains to be overcome to entitle it to the first rank among the preparations of iron.

In studying the molecular constitution of this remarkable salt, it is easy to see that it belongs to the class of bodies endowed with the character of polymorphism. Like sulphur, phosphorus, arsenious acid, and many other polymorphous substances, pyrophosphate of iron will therefore present great differences in its chemical properties according to the process adopted in its preparation, and the temperature at which it has been obtained. By precipitating a solution of persulphate of iron with one of pyrophosphate of soda, taking care to operate at a temperature below 59° F., we obtain a gelatinous precipitate which is nothing else than pyrophosphate of iron ($\text{Fe}^2 \text{O}^3, 3\text{Ph O}^5$) dissolving with the greatest facility in a solution of pyrophosphate of soda. If the ferruginous salt were obtained at a temperature above that just mentioned, and *a fortiori*, at a boiling heat, a considerable quantity of pyrophosphate of soda would be required, and still we should obtain only an unstable solution, acquiring a black color, and having an insupportable taste. In fact, whatever precaution we take, not less than four parts of pyrophosphate of soda are required to dissolve sixteen of the gelatinous ferruginous precipitate, representing three parts of the salt dried at 212° F. When the solution is prepared in the cold it keeps for some time without change, and might be converted into a syrup which would keep tolerably well in close vessels for one or two months.

However, such a mixture contains too large a proportion of pyrophosphate of soda, which gives it a disagreeable saline taste, and does not prevent it, after a larger or shorter interval, from blackening on exposure to the air, and acquiring a more and more decided metallic taste. It was, therefore, necessary to seek for another solvent. That which I have found to succeed best is the citrate of ammonia, a salt which has the double advantage of being capable of employment in very small quantity, and of chemically concealing iron from reagents."

"The solution of pyrophosphate of iron in a citro-ammoniacal liquor keeps for whole months without undergoing any change, and yields a syrup free from the intolerable taste of ferruginous compounds. Potash, ammonia, and the alkaline carbonates do not give with pyrophosphate of iron, so dissolved, the reaction peculiar to the salt of iron."

M. Robiquet further observes, "the latent state in which it exists in this new salt, enables us to mix it with wine of bark, and to obtain from it a powerful tonic, without having to fear the blackish discoloration and inky taste, which are always produced when a salt of iron is brought into contact with fluids more or less highly charged with tannin."

"In whatever mode the citro-ammoniacal pyrophosphate of iron be administered, it has absolutely no taste, and patients not only bear it readily, but feel the best effects from its use. I have seen it particularly useful in well marked cases of anemia, chlorosis, and chronic urethritis."

M. Robiquet says, that dry pyrophosphate of iron contains 21.11 per cent. of iron, that its therapeutic qualities entitle it to the first rank among ferruginous compounds, and gives the following formula for preparing the syrup, viz.:

SYRUP OF PYROPHOSPHATE OF IRON.*

"Take of Pyrophosphate of iron two drachms and a half;

Simple Syrup twenty-nine ounces;

Syrup of Orange flowers three ounces;

make a syrup by simple solution, and color with a sufficient quantity of tincture of cochineal or alkanet. Each drachm of the syrup contains about six tenths of a grain, and a tablespoonful about three grains of the salt of iron."

* See page 404.

In making the "FERRUGINOUS WINE OF BARK," $2\frac{1}{2}$ drachms of the pyrophosphate and 77 grains of extract of pale bark are dissolved in 32 ounces of white wine.

Subcarbonate of Bismuth.—Dr. Hannon, of Brussels, (*Bull. de Therapeutique*, Feb. 15, 1857,) gives the following method of preparing this salt and of using it therapeutically: The bismuth is first purified by melting the metal in powder with ten times its weight of powdered nitre. After cooling, the metal is again powdered, and this process with nitre repeated, which frees it from arseniurets and sulphurets, which it almost always contains. One part of this bismuth is then dissolved in three parts of nitric acid, the solution evaporated to two-thirds of its bulk, and then added drop by drop to a solution of carbonate of soda, when a white subcarbonate of bismuth precipitates. The precipitate is then washed five or six times with distilled water, and lastly on a filter to remove all traces of carbonate of soda. After drying, it should be preserved in well stopped vials.

Dr. Hannon remarks that the physiological properties of the salts of bismuth are very little known, for the reason that the subnitrate is the only salt which has been employed in medicine, and the insolubility of this salt renders it inefficient in most of the cases in which it is indicated. The subcarbonate now considered is soluble in the gastric juice, its action is rapid, it produces no sensation of weight in the stomach like the subnitrate, it rarely constipates, colors the stools less than the subnitrate, and may be long employed without oppressing the stomach. The action of the subcarbonate appears to be at first sedative and subsequently excites the phenomena which result from the action of tonics.

Its therapeutical uses point to "all cases of gastralgia consecutive upon phlegmasia of the digestive passages, cases in which the tongue is red and pointed, and cases in which the digestion is laborious and accompanied with putrid and acid eructations, or in which there is a tendency to diarrhoea or spasmodic vomiting," demand the employment of subcarbonate of bismuth. This salt is also indicated "in the vomiting of children, whether caused by teething or caused by fits of indigestion, and in the diarrhoea of weak children, especially when occurring at the time of weaning."

Subcarbonate of bismuth is entirely insipid and excites no disgust. It is given before meals. Adults take it in water, and children in honey. It may be made into lozenges. The doze for adults is from 15 to 45 grains, taken three times a day in increasing doses.—*B. & F. Med. Chir. Review.*

ON SYRUP OF PYROPHOSPHATE OF IRON.

By THE EDITOR.

In the remarks on syrup of pyrophosphate of iron, from the paper of M. E. Robiquet, inserted at page 401, the reader will observe a want of clearness that leaves one in doubt in regard to the mode of making the preparation. He says that citrate of ammonia or a citro-ammoniacal liquid will dissolve the ferruginous pyrophosphate, without giving the quantity or mode of application of the solvent; and in the formula for the syrup this solvent is not even mentioned. To satisfy ourselves on this point we prepared some hydrated pyrophosphate of sesqui-oxide of iron, and found that neutral citrate of ammonia did not dissolve it; we then tried an alkaline citrate and found it successful, and now offer the following formula to such of our readers as may incline to make the preparation. The formula of Robiquet is so slightly ferruginous that it has been thought better to increase its strength to eight grains to the fluid ounce, or one grain to each teaspoonful.

Take of Pyrophosphate of soda,	120 grains.
Solution of persulphate of iron,	
Water, of each a sufficient quantity,	
Citric acid,	40 grains.
Liquor ammonia, q. s. or about	1½ fluid drachms.
Syrup of orange flowers,	2 fluid ounces.
Simple syrup,	q. s.

Dissolve the pyrophosphate in four ounces of water; add the solution of sesquioxide of iron until it ceases to precipitate; then wash the white gelatinous pyrophosphate of iron, in a filter till the washings pass tasteless. After draining, the pyrophosphate is triturated in a mortar with the citric acid previously powdered, and the ammonia gradually added, with constant stirring,

until a transparent, reddish-brown solution is obtained, avoiding much excess. This is then filtered, if necessary, mixed with the syrup of orange flowers and sufficient simple syrup to make the whole measure fourteen fluid ounces. The syrup has a slightly ammoniacal saline taste, not ferruginous, a light reddish-brown color, and may be given in teaspoonful or dessert-spoonful doses, according to circumstances, in a little water.

According to Gmelin, (Handbook, Vol. V, p. 229,) pyrophosphate of sesquioxide of iron is a sesqui-salt, having the formula of $2\text{Fe}^2 \text{O}^3, 3\text{bPO}^5 + 9 \text{Aq.}$ Consequently it is necessary to use three equivalents of pyrophosphate of soda, $3 (\text{Na}^2 \text{bPO}^5)$ and two equivalents of ter-sulphate of iron, $2(\text{Fe}^2 \text{O}^3, 3\text{SO}^3)$ to form one equivalent of the salt.

It may be well to remark that pyrophosphate of soda is easily made from ordinary medicinal phosphate of soda, by first drying off its water of crystallization, and then heating it to redness and fusion. The solution of persulphate of iron is made as directed in the U. S. Pharmacopœia for the purpose of precipitating hydrated sesqui-oxide of iron.

EAU DE VICHY—ARTIFICIAL VICHY WATER.

By WILLIAM PROCTER, JR.

About eighteen months ago Dr. John Bell, of Philada., (who has made the mineral waters a special study,) requested me to make for him a dozen bottles of artificial Vichy water by the formula of Soubeiran. Since then I have prepared many dozens for other persons at the instance of Dr. Bell. Finding, however, that its cost in material and trouble did not enable me to furnish it at a price to warrant its free consumption, not having command of a carbonic acid apparatus, for generating and for bottling under pressure, I suggested to Dr. Bell that he should induce Mr. Roussell, or other manufacturer of carbonic acid water, to engage in its preparation. Subsequently Dr. Bell suggested this idea to Mr. Frederick Brown of this city, who now prepares it, as I have learned, through an editorial notice in the North American Medico-Chirurgical Review.

The attention of the medical profession having thus been attracted to the artificial Vichy water, it is proper that a notice of

the preparation should appear in our columns for the information of pharmacutists who may desire to make and vend this artificial water.

According to M. Longchamps, whose analysis was adopted by Soubeiran, (*Traité de Pharm.*, 1847,) the 'natural Vichy water from the Grande-Grille spring, the one most usually drank by visitors, is as follows :

Carbonate of soda, crystallized,	13.592 grammes.
Carbonate of lime, . . .	0.356 "
Carbonate of magnesia, . . .	0.085 "
Carbonate of iron, . . .	0.004 "
Sulphate of soda, crystallized, .	1.061 "
Water,	1000.000 "

Reasoning on the probable play of affinities M. Soubeiran constructed the following formula for preparing the water artificially, (*Traité, &c.*, page 726, tome 2d,) in which bicarbonate of soda is substituted for the carbonate and sulphate of magnesia for a part of the sulphate of soda and carbonate of magnesia, viz :—

	Grammes.		Grains.
Take of Bicarbonate of soda, . . .	8.748	=	135.
Chloride of sodium, . . .	0.167	"	2.577
Chl. of calcium, crystallized,	0.775	"	11.961
Sulphate of soda,	0.740	"	11.421
Sulphate of magnesia,	0.246	"	3.796
Tartrate of iron and potassa,	0.009	"	0.138
Water,	one litre,	pints	2.113
Carbonic acid,	five litres,	vol.	305 cu. b in.

He directs the salts of soda and the salt of iron to be dissolved in a part of the water, the sulphate of magnesia dissolved and added, and lastly the chloride of calcium in the remainder of the water, when the mixed solutions are charged with the carbonic acid gas under pressure.

The formula I have used is a slight modification of that of Soubeiran, the variation being made to get rid of small fractions, and instead of forcing gas into the solution, the salts are dissolved in the smallest possible quantity of water, put in the bottles, and then these filled with carbonic acid water.

For one dozen bottles of Vichy water.

Take of Bicarbonate of soda,	. . .	13.5 drms. (Troy.)
Chloride of sodium,	. . .	15.4 grains “
Chloride of calcium, (fused and dry)		36.0 “
Sulphate of soda, crystallized		68.5 “
Sulphate of magnesia, “		22.7 “
Tartrate of iron and potassa,		0.83 “
Water,		two pints.
Carbonic acid water,		ten pints.

Prepare twelve pint bottles with good corks. Dissolve the chloride of calcium in six fluid ounces of water and set it aside. Then dissolve the salts of soda and the salt of iron together in the remainder of the water, add the epsom salts, and when dissolved, filter. Divide this solution equally among the twelve bottles, and then having added half a fluid ounce of the solution of chloride of calcium to each, proceed to fill them with carbonic acid water (drawn quickly from the fountain,) cork securely and tie over.

On adding the chloride of calcium to the other solution a gelatinous precipitate of carbonate of lime is formed which dissolves immediately through the agency of the carbonic acid water. It is better to add the chloride as you proceed than to mix all at once, as the solution of the precipitate is rapid in proportion to its gelatinous condition.

For a Fountain of Twelve Gallons.

When made on a large scale, the following recipe may be employed to make a twelve gallon fountain.

Take of Bicarbonate of soda,	. . .	13½ ounces (Troy.)
Chloride of sodium,	. . .	123.2 grains. “
Chloride of Calcium, (fused and dry)		288.0 “ “
Sulphate of soda, crystallized,		548.0 “ “
Sulphate of magnesia, “		181.6 “ “
Tartrate of iron and potassa,	. . .	6.64 “ “
Water,	. . . . .	twelve gallons.

Dissolve the soda salts and the iron salt in a portion of the water filter and pour it in the fountain, then add the epsom salts previously dissolved, and lastly the chloride of calcium in the remainder of the water. The fountain is now to be charged as

in making ordinary carbonic acid water, and is then finished, and may either be sold on draught, or bottled by the apparatus used in bottling mineral waters under pressure.

Since the formula of Soubeiran was published, several analyses of Vichy water have been made which have proved its composition to be more complex than the analyses of Longchamps states it to be. The best of these is that of M. Bouquet, read to the French Academy in August 1854. He gives the composition of the water of the Grande-Grille spring as follows. The quantities of each ingredient *by weight* in a litre of 1000 grammes is as follows, viz :—

Free carbonic acid,	0·908	Sulphate of soda,	0·291
Bicarbonate of soda,	4·883	Phosphate of soda,	0·130
Bicarbonate of potassa,	0·352	Arseniate of soda,	0·002
Bicarbonate of magnesia,	0·303	Borate of soda,	traces.
Bicarbonate of strontian,	0·003	Chloride of sodium,	0·534
Bicarbonate of lime,	0·434	Silica,	0·070
Bicarbonate of protox. of iron,	0·004	Bituminous matter,	traces.
Bicarbonate of protoxide of manganese,	traces.	Total	7·914

It is thus seen that natural Vichy water contains arsenic, phosphoric, boracic, and silicic acids, besides potassa, strontia and manganese. More recently M. Nickles (*Jour. de Pharm. Juillet 1857*,) has announced the presence of fluorine, whilst other chemists have believed bromine and iodine were present. If desired, the more important of these additional ingredients might be added, and thus approach the artificial water more nearly to that of the spring; but the disproportion between the other ingredients in the two formulæ renders such additions of doubtful propriety without entirely reconstructing that for the artificial water.

CHEMICAL RESEARCHES ON AMYLENE.

By M. DUROY.

A memoir communicated to "*l'Académie Impériale de Médecine*," of Paris. Translated and abridged from *l'Union Médicale*, of April 7 and 9, 1857, by M. MORTON DOWLER, M. D., New Orleans.

Properties of Potato-Oil.

Potato-oil, which also bears the synonymes of *amylic alcohol*, the *bi-hydrate of amylene*, and the *hydrate of the oxyde of amylene*, (*fusel oel*, of the Germans,) in the form in which we

obtain it from the potato distilleries, always contains ordinary oil—to such extent, indeed, that it is not rare to find it in the proportion of fifty per cent. The potato-oil is, moreover, most generally colored, and presents a burning, penetrating and disagreeable odor which sensibly diminishes during rectification. It is of much importance to purify the potato-oil, which is used for the preparation of amylene; for without this precaution the chloride of zinc, acting on the ordinary alcohol and carbonizing the coloring matter, develops an empyreumatic product which ought to be avoided from the beginning, otherwise thus taking birth, and accompanying the amylene, it cannot be separated from it subsequently.

M. Hepp has recommended, following the process of M. Cahours, to agitate the potato-oil with water in order to remove the alcohol; but if this process has succeeded in the hands of our learned *confrère*, it must be owing to the fact of his being in possession of almost pure amylic alcohols; for, if like ourselves, he had had the misfortune to get hold of none but highly alcoholic potato-oils, he would, like us, have found that the washings, while carrying away the ordinary alcohol, would likewise carry away the fourth, the half and even the whole of the potato-oil. The water separates the alcohol, it is true, but the latter acquires immediately a great solvent power over the potato-oil. Before submitting it to washing, we should, in all cases, look to the quality of the amylic alcohol, and in view to this we here submit the parallel of character which we have observed between the pure and impure amylic alcohols:

Qualities of pure Amylic Alcohol.

Potato oil is a colorless, limpid liquid, of an oily appearance, of a strong odor; agreeable in its first impression, but afterwards nauseabund in a high degree. When its vapor is respired, asthmatic symptoms occur, which produce cough, and even vomitings. Its taste is very acid. It is inflammable, and burns with a whitish blue flame. It boils at 270°, and its sp. gr. is 0.812.

At 19° or 20° it solidifies, form-

Qualities of impure Amylic Alcohol.

The crude potato-oil is more fluid and less oily; its odor is more alcoholic and stronger, being ordinarily colored, and more inflammable than the pure oil. When it contains only one-tenth of ordinary alcohol, and an iron plate is moistened with it, it burns when brought into contact with the flame of a bougie. The oil of potato is very combustible; but it will not take fire under such condition, from the fact that its volatilization and combus-

ing crystalline scales. It stains paper, the stains disappearing some time after. It is sparingly soluble in water, to which it imparts its odor. It mixes in all proportions with alcohol, and ether and the fatty and the essential oils, etc. (Liebig).

We may add that in agitating this pure oil with water in a wide tube, it arises again to the top, and occupies the same space in the tube that it occupied at first. In the experiment, the potato-oil ought to retain its transparency, and the water itself ought to remain limpid. When an iron blade, moistened with it, is brought near the flame of a bougie, the metal, receiving a part of the heat, leaves no trace of the amylic alcohol. In order to inflame, under these circumstances, the potato oil must be at 39° to 40° of the aërometer. This test is of value only in the absence of ordinary alcohol.

tion demand a higher degree of heat than can be imparted to it in an *instant* on the conducting metal.

Pouring a little of this product in a glass tube containing water, and reversing the tube, after having corked it, the crude oil changes the water, in traversing it becomes opalescent, and communicates to it a milky appearance; and if the experiment be conducted in a graduated tube, and the mixture be strongly agitated, after repose it will be observed that the superincumbent oil is diminished in quantity, correspondingly with the amount of alcohol which has been dissolved.

When it contains alcohol, the latter is naturally accompanied with water; but the mixture is rapidly warmed, when a salt which has a strong attraction for water is introduced, as the dry chlorides of zinc and calcium.

Purification of Potato-Oil.

We must look to the method which possesses the greatest efficacy, and which is at the same time the least expensive. After various trials, the method of purification which has been attended with the best success in our hands, is the following: I pour the amylic alcohol in the cucurbit of an alembic, and adding four or five times its volume of water, I agitate the mixture, and luting the apparatus, I distil with a very moderate heat. At first, the resulting product is a limpid and homogeneous product, odor strongly alcoholic, and miscible with water without turbidity. Up to this the product appears to be ordinary alcohol, but soon the distillation slackens, and then the first product must be removed, and the recipient must be changed. At this second step, the distilled liquor is milky, which is a mixture of ordinary alcohol, amylic alcohol, and water; then comes the amylic alcohol almost pure, accompanied with water only; and finally, the distillation is to be arrested, when it is found that nothing passes over but

an aqueous product. The second recipient contains the amylic alcohol, which is to be separated by means of a syphon. In this state it still contains a little ordinary alcohol, so great is the affinity of the two liquids for each other. The product may now be washed without much loss; but this washing not having all the desired efficacy, unless frequently repeated, I have recourse to a second means, which has been perfectly successful, not with a view of removing the water as has been recommended, but with a view of radically separating the alcohol. I rectify on a great quantity of dry chloride of calcium, this salt having the effect of dehydrating and concentrating ordinary alcohol, and by these means giving it the property of volatilizing at a low temperature, and by this means also the alcohol passes immediately by distillation. After this, there is a marked arrest of distillation, though the heat continue the same, and the recipient is to be replaced by another vessel destined to receive the potato-oil, which, by increasing the heat, is now wholly distilled over in the desired purity.

Preparation of Amylene.

Whilst physiologists are conducting experiments with a view of studying the effects of amylene on man and animals, an uncertainty rests on the whole, from the fact that all the products employed under the name of amylene, are only multiple compounds of several carburets, and I shall hereafter show that these amylenes contain besides, sometimes ether, but up to the present time, *always amylic alcohol*. Now the main question is to determine, if we can, as an industrial process, succeed in the manufacture of amylene properly so called. If the difficulty of obtaining pure amylene should so augment the price as to render its surgical employment impracticable, and if, at the same time, it is, nevertheless, found that a mixture of amylene, paramylene, metamylenes, etc., possesses a real value, useful properties, and, in fine, is worthy of being adopted as an anæsthetic, we ought, at once, to determine the precise character of the article to be used—the quantity of absolute amylene which this compound of the hydro-carburets ought to contain. Thus we ought to determine the highest boiling point, and never to use a product leaving a residuum, on distillation, beyond this *maximum* of heat. We should seek the means of recognizing its bad qualities, and of

showing its adulterations. But most specially should pharmacutists and chemists bestir themselves with a view of furnishing a good preparation at the lowest possible price.

Apparatus.—The material composing the apparatus is a subject worthy of consideration. Glass retorts are generally used when active reagents are required ; and in this view the chloride of zinc would appear to demand their employment, there being no chemical action thereby produced on the glass, and its transparency permitting ready observation. Amylene, up to the present time, has generally been prepared by means of glass vessels. I myself used them in my first trials, but I soon realized their insufficiency and inconvenience. They are not adapted to an extensive production of amylene ; they required a great deal of combustible material, and from their fragility, they expose the manipulator to the occurrence of serious accidents. A distillation from glass is tedious and difficult, even when we take the greatest care to cover the arch of the retort in the most careful manner in the sand-bath, in order to retain the heat. If amylene were produced at a low temperature, and if it passed *alone* into the receiver in distillation, these inconveniencies would not exist ; but as it comes over at first with its congeners, paramylene and metamylenes, these heavy vapors when at the summit of the retort, give out their latent heat, and they become condensed, and, for the most part, descend again. Meanwhile the chloride of zinc becomes concentrated, abandons a part of its water, and becomes more and more active, and it then carbonizes a part of the amylic alcohol and of the hydro-carburets, and at the same time this radical alteration imparts to the amylene a strong empyreumatic odor. I therefore now make use of a copper alembic, this metal not being acted on by the chloride of zinc. In this apparatus, which is indeed required in every laboratory, the process is conducted, at a less expense, and by its use we make a considerable step towards the reduction of the price of amylene.

PRELIMINARY EXPERIMENTS.

The action of the Chloride of Zinc, at different degrees of temperature, on Amylic Alcohol.—I. When potato-oil is agitated with the chloride of zinc coarsely broken, the mixture becomes a little heated, and on reposing, the saturated oil being separated from the excess of the salt, and mixed with a certain proportion of

water, in order to remove the chloride, there will be found after the evaporation of this water, a residuum of the chloride of zinc, of one-tenth of the weight of the oil which has been withdrawn. Thus a gramme of the concrete chloride of zinc dissolves in ten grammes of the potato-oil.

II.—A particle of the oil which has remained on a particle of the chloride of zinc, is colored in a few minutes, and before the next day a great part of the oils is carbonized; and, therefore, in the concrete and *cold* state, this salt acts strongly on the potato-oil.

III.—When the oil is impregnated with only little fragments of the dry chloride of zinc, and left to react for an hour, and if then a little water be added, the latter uniting with the chloride will immediately produce sufficient heat to disengage light bubbles, the odor of which seems to approach very nearly to that of amylene.

IV.—An oily solution, saturated with the chloride of zinc, as in the first experiment, does not become carbonized. If we shall have made such solution several days previously, the elements of the oil will now be found to have become slowly modified and disposed to give out a greater quantity of amylene by distillation. I am informed that M. Hepp has also observed the same fact.

V.—After many days preparation, I have made the distillation without adding anything to the above saturated solution. I have obtained a product which was not pure amylic alcohol, nor was it amylene, or at least there was but very little of the latter present.

VI.—Seeing that the quantity of the chloride of zinc dissolved by the amylic alcohol was not sufficient to transform it into the hydro-carburets, I introduced into the cucurbit of a little copper alembic, placed in a sand-bath, dry chloride of zinc to the amount of about the one-sixth the weight of the amylic alcohol employed. I poured on this chloride a sufficient quantity of amylic alcohol to cover it, the alcohol having previously been saturated with the chloride, and the head of the alembic being well luted and connected by means of a caoutchouc to another tube descending from a glass reservoir with a stop-cock, and which contained the remainder of the amylic alcohol. On the other side, I put a re-

ceiver of the same dimensions with the reservoir and graduated in the same manner. Moreover, certain special precautions were observed, and every thing was disposed as in M. Scottman's apparatus for the production of ether. The refrigerator was filled with ice, and the distillation was carried on by means of a slow fire.

The operation soon began, and proportionally as the liquid ascended into the receiver, I caused the fluid in the reservoir to descend into the cucurbit. The distillation went on with great rapidity, and I suspended it in a short time after exhausting the reservoir. The product separated from the water and rectified in a glass retort by means of a water-bath, was by no means pure amylene; but it was abundant. It possessed a somewhat stronger odor than that which I had procured by means of the concentrated chloride. It is very nearly identical with the amylene of Dr. Snow. In varying the proportions and the state of concentration of the chloride, I hoped that this apparatus would produce good results.

VII.—In this experiment I have followed the process of M. Hepp, which consists in mixing in a retort equal parts of amylic alcohol and the chloride of zinc at 70 degrees of the aërometer of Baumé, agitating the distilled product with an equal volume of sulphuric acid, separating the acid, and then rectifying by means of the water-bath. The boiling of this amylene commenced at $+88^{\circ}$ F. and was carried to $+147^{\circ}$ F.

VIII.—The experiment similar to the preceding, with the exclusion of sulphuric acid: The product being simply rectified by means of the water-bath at the temperature of $+140^{\circ}$ F., and agitated for a long time with one-eighth of its weight of dry chloride of zinc, and again distilled, an amylene resulted, the ebullition of which commenced at $+86^{\circ}$ F., and required at the end $+122^{\circ}$. The chloride of zinc is to be preferred, because it does not develop, like sulphuric acid, a disagreeable odor.

IX.—Dissolving in water the chloride of zinc, still impregnated with the amylene of the eighth experiment, an oily liquor came to the surface of this solution. This oil, heated in a water-bath to 100° for an hour, was not volatilized. Testing it with potash, valerianic acid was produced. *Thus amylene, rectified by the water-bath below 140° F., retains a great deal of amylic alcohol;*

but this experiment shows, that the dry chloride of zinc has the property of removing this alcohol, without affecting the amylene.

These experiments go to show the difficulty, not to say impossibility of discovering a facile and inexpensive method of obtaining pure amylene. Let us examine the qualities of the amylenes in use: I have taken four different preparations, namely; 1, that of Dr. Snow (A); 2, that of M. Ménier (B); 3, that which I have prepared according to the process of M. Hepp (C); 4, the amylene obtained in the sixth experiment (D). The fixity of the boiling points, being one of the principal means of defining a liquor compound, I distilled in succession these four amylenes in a small retort provided with a thermometer. The following was the result:

Boiling of product A	began at	+ 86°	F.	and closed at	+140°	F.
"	B	"	+ 84°	"	"	+167°
"	C	"	+ 86°	"	"	+143.6°
"	D	"	+ 88°	"	"	+134°

This variation in the degrees necessary to the ebullition of these products, indicates not only the presence of carburets more volatile than amylene; but, on the contrary, also the presence of bodies less volatile.

Action of Potassium on impure Amylene.—The amylene having a badly defined character may be nothing other than a mixture of the different carburets, and of amylene properly so called. In such case potassium would have no more action on them than it would have on the oil of naphtha, in which it is placed for preservation. But such is not found to be their condition, the potassium oxydating in these amylenes, and giving out hydrogen gas in abundance. In order to determine the quantity given out, I have taken a little dry flask to which I adjusted a curved tube, passing it into a hydro-pneumatic receiver with a graduated scale, and I have placed successively in this flask an equal weight of the aforesaid amylenes, with a large excess of brilliant potassium cut into small pieces. The disengagement of gas was rapid in each experiment:

3 grm. of amylene A,	in contact with potassium,	gave out	64	cubic centimetres of hydro. gas.
3 grm. " B,	"	"	91	" "
3 grm. " C,	"	"	75	" "
3 grm. " D,	"	"	69	" "

The action of Potash on impure Amylene.—The oxydation of potassium, and the consequent disengagement of hydrogen, would

indicate the presence of potato-oil, and perhaps a little ether derived from the alcoholic oil; but it is especially probable that this reaction takes place between the metal and the elements of the amylic alcohol, in which is found two equivalents of water. Moreover, there is potato-oil found in it by agitating with portions of potash, which is slightly humid, and there is here soon developed the odor of valerianic acid, rendered still more sensible by the addition of sulphuric acid.

Purification of Amylene.

Knowing that the amylenes in actual use are but mixtures of amylene, the isomeric carburets and amylic alcohol, and having proven by experiment the difficulties that are to be encountered in obtaining the absolute amylene ($C^{10} H^{10}$) of M. Balard, and desiring to obtain the *type of this product*, I continued my experiments on rectification. Already it had occurred to me that at a very low temperature, with the water, both amylic alcohol obstinately passes over with the amylene, but that happily this alcohol can be separated by the chloride of zinc. I treated at several times impure amylene with this salt in its dry state, redistilling many times, and I have thus obtained a liquid which is neutral in the presence of potassium. But by the test of the thermometer, I have still realized the inconstancy of the boiling point. These repeated rectifications had caused the loss of the very volatile elements which boil between $+84^{\circ}$ and $+93^{\circ}$; and on the other hand the extreme of $+140^{\circ}$ was reduced to $+113^{\circ}$. I then obtained a fluid which boiled between 93° and 113° . I thereupon, for the last time, put the fluid in the retort, and I collected *none save the part which distilled fixed at $+95^{\circ}$* . This time I procured the pure amylene of M. Balard—but at what price! I obtained forty grammes of amylene (ten drachms) from five litres (ten pints) of amylic-alcohol! We must surely hope better things on the score of economy.

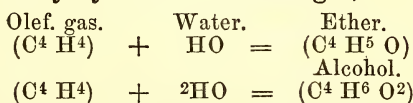
To sum up, the essential character of amylene is: 1, to boil at $+95^{\circ}$ F. fixed; 2, to possess no action on potassium, and to preserve this metal like the oil of naphtha; 3, to receive no coloring from the presence of caustic potash *even when prolonged*; 4, to give birth to no valerianic acid under the action of the hydrate of potash.—*New Orleans Medical and Surgical Journal*, July, 1857.

HYDRIDE OF AMYLE.

By T. and H. SMITH, Edinburgh.

In presenting a specimen of the new anæsthetic discovered by Professor Simpson, the hydride of amyle, and which we had the pleasure of preparing for him, it may not be out of place to make a few remarks regarding its history, chemical characters, and physical properties.

Dr. Frankland, Professor of Chemistry, Owen's College, Manchester, discovered it in the course of an investigation undertaken for another object. It had long been disputed whether ether and alcohol were merely hydrates of olefiant gas,



or whether they were constituted by the union of a compound radical ethyle ($\text{C}^4 \text{H}^5$) with oxygen ($\text{C}^4 \text{H}^5$) + O = ($\text{C}^4 \text{H}^5 \text{O}$) in the case of ether; alcohol being merely its hydrate ($\text{C}^4 \text{H}^5 \text{O}$) + HO = $\text{C}^4 \text{H}^6 \text{O}^2$).

This last view had been advocated strongly by Liebig, although the very existence of organic radicals remained at that time entirely hypothetical; yet Liebig expressed his conviction that the ethyle radical ($\text{C}^4 \text{H}^5$) would be obtained in a separate state.

Dr. Frankland, in entering on the interesting and able investigation of which the hydride of amyle was one of the fruits, was influenced by the desire of deciding this question by separating the radicals themselves, and more especially those of the different alcohols and their derivative ethers. The subject was undoubtedly a most difficult one, and required a clear head, profound chemical knowledge, and nice accuracy of manipulation.

Dr. Frankland began with wine alcohol, and unquestionably separated the radical ($\text{C}^4 \text{H}^5$) ethyle, but which existed as a vapor even below the zero of F. He concluded, from the much higher equivalent of amylic alcohol ($\text{C}^{10} \text{H}^{12} \text{O}^2$) and the higher density of its vapor, that the radical amyle, if he should succeed in obtaining it, would exist as a liquid at ordinary temperatures, and thus give the means of ascertaining its nature more certainly, and also give a clue to a correct understanding of the character and functions of the compound radicals in general, and more

especially of those which exist in the class of bodies called alcohols, on account of the great theoretical and practical interest belonging to them in a chemical point of view.

The method by which Dr. Frankland obtained and proved the existence of amyle, the radical of amylic alcohol, was to heat for several hours in an oil-bath iodide of amyle prepared from pure fusel oil by the simultaneous action of phosphorus and iodine on it,* in sealed glass tubes, along with granulated zinc at a heat of 190° C. (374° F.) and then distilling off the products of decomposition. The first two-thirds came off at a heat of about 80° C., and the remaining third at about 160° C. (320° F.) The first distillate on rectification proved to be a liquid boiling at about 55° C. (95° F.), and on acting upon the liquid with anhydrous sulphuric acid, he separated a carbo-hydrogen polymeric with olefiant gas ($C^{10}H^{12}$), and on then distilling the part unacted on by the acid, he obtained a liquid having the composition ($C^{10}H^{12}$), with the very low boiling point of 30° C. or 86° F., which, in place of having an unpleasant odor and tar-like taste as the mixture had, possessed, on the contrary, a grateful fruity odor, and was tasteless.

This was the hydride of amyle, whose decided and energetic anæsthetic action Dr. Simpson has just discovered.

It is a clear colorous mobile liquid, and is the lightest fluid known, having the very low density of .638 at 57° F., and a vapor density of 2.5. It is very inflammable, and burns with a brilliant white and smokeless flame. It is insoluble in water, but readily soluble in alcohol and ether. It is a very stable compound, resisting the action of fuming sulphuric acid and the most powerful oxydizing agents. Its rational formula is ($C^{10}H^{11} + H$), and therefore the hydride or hydruret of the radical amyle.

The liquid that was distilled last from the tube at a high heat

* The iodide of amyle is a colorless, transparent, heavy liquid; density 1.5. It is not readily decomposed, not changing color even when kept for a long time in diffused daylight, although the direct rays of the sun decompose it easily. It mixes readily in all proportions with oils and ointments. In consequence of this, and the large quantity of iodine—two-thirds of its weight—which it holds in a perfect state of solution, it seems to us to be worthy of attention as an outward application, and all the more that the iodine is in the most favorable condition for being absorbed.

proved to be the pure radical, and which had now been got in a separate form for the first time. This liquid is colorless and clear, of a density of .770, and boils at 155° C., or 311° F., and the density of its vapor is 4.9.

As Dr. Frankland found, in his previous investigations for the discovery of the radical of wine alcohol, that on exposing the iodide of ethyle with an equal bulk of water along with zinc in sealed tubes to the action of heat, the only product was the hydride of ethyle, he was led to try the same process with the iodide of amyle, and the result of the use of water in the reaction was exactly analogous. Instead of a mixture of amylene, amyle and its hydride, he now obtained as the only product of decomposition the hydride of amyle, which distilled off at a very low heat, and after digesting the liquid for twenty-four hours with caustic potash, and redistilling at 35° C., or 95° F., was obtained quite pure.

He also found, that by the addition of water to the iodide and zinc, the decomposition easily took place at a heat of 140° C., or 285° F., whilst with the iodide and zinc alone a heat of 190° C. was required, besides the necessity of amalgamating the zinc.

On proceeding to prepare the hydride for Dr. Simpson, we very soon discovered the unsuitableness of sealed tubes, as used by Dr. Frankland, for its preparation in sufficient quantity to test its powers as an anæsthetic. We therefore got much larger tubes made, and carefully annealed, of one inch internal diameter, and $\frac{3}{16}$ of an inch thick; and instead of being sealed, which necessarily involved their destruction at each operation, we had them effectually closed by accurately ground stoppers, and these again strongly fixed down in their places by a metal bridle, with a binding screw. But from the enormous pressure, not less than 300 lbs., or twenty atmospheres, by calculation, to the inch, there was extreme difficulty in getting the stoppers perfectly tight. Seeing, however, superior advantages in this plan over the other, if the stopper could be made tight, we were induced to persevere, and at length, with great care in the grinding, succeeded in making an absolutely tight tube, even under such great pressure.

But from the great risk of explosion with such size tubes, we afterwards gave up the idea of glass ones altogether. One of

these, after being exposed to the usual heat with a charge for more than an hour, burst into innumerable fragments with a tremendous explosion, breaking the thermometer and blowing out the sides of the bath, whose scalding contents were scattered about in all directions, but fortunately without doing any personal injury. This occurrence proved the necessity of adopting another plan, and we therefore thought of a copper tube, which idea, however, was nearly put aside, under the fear of a strong galvanic action being induced, and interfering with the desired action; but, on reflection, such a result seemed to be of a favorable nature rather than otherwise, and we have now found that a copper tube answers admirably—and, in fact, part of what we made for Dr. Simpson was prepared in one.

A key to the explanation of the formation of the hydride of amyle is found in the tendency of the radical amyle to combine, not only with electro-negative, but also electro-positive elements. Thus there are not only compounds like the following:—

Amyle.		Electro-negative elements.
$(C^{10} H^{11})$	+	O
$(C^{10} H^{11})$	+	Cl
$(C^{10} H^{11})$	+	Br
$(C^{10} H^{11})$	+	I;

but also—

		Electro-positive elements.
$(C^{10} H^{11})$	+	Zn
$(C^{10} H^{11})$	+	H

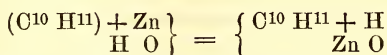
Dr. Frankland succeeded in preparing both zinc methyle, zinc ethyle, and zinc amyle. These have all an intense attraction for oxygen. In the case of zinc methyle, it equals potassium in that respect; a small glass tube, containing only a few drops of the liquid zinc methyle, actually became red-hot on being placed under water, from the great intensity of the chemical action. The zinc ethyle is a liquid of 1.18 density, boiling at $118^{\circ} C.$ or $244^{\circ} F.$, and having a vapor density of 4.25.

All these metallo-organic bodies have such an attraction for oxygen that the most extraordinary precautions are necessary in preparing and distilling them, both to get quit of every trace of water, and to exclude the presence of air by replacing it either with an atmosphere of hydrogen, nitrogen, or carbonic acid.

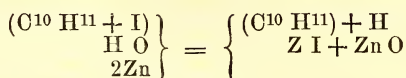
The moment one of these metallo-organic compounds comes in

contact with moisture, it is decomposed : the zinc takes the oxygen and the radical the hydrogen from an equivalent of water.

One of the methods of analysing it is indeed founded on this character : thus in the case of the amyle compound the action is as follows :—



And the production of hydride of amyle appears to be as here represented :—



Consequently, in distilling after the compulsive action of heat and great pressure, the hydride comes over, and there remains in the digester an oxyiodide of zinc.

In preparing the hydride of amyle the first step necessary is the purification of the crude fusel oil, which is a mixture of propylic ($C^6 H^8 O^2$), butylic ($C^8 H^{10} O^2$), and amylic alcohols ($C^{10} H^{12} O^2$), and of other alcohols much higher in the series ; so that the boiling, as we found, rises much higher than even 400° F. before the distillation comes to a close. As the boiling point rises from that of propylic alcohol (203° F.) to that of amylic alcohol (269° F.), it can hardly be doubted that the hydrides of the corresponding radicals would vary in their boiling points in at least an equal degree ; and as the hydride of amyle has a boiling point of 86° F., there can be little question that the boiling points of others lower in the series would be so low, that at ordinary temperatures they would exist only as vapors. Dr. Frankland accordingly found that the hydride of ethyle ($C^4 H^5 + H$) still remained gaseous, even when submitted to twenty atmospheres of pressure.

A question here suggests itself to the mind ; may not these hydrides, existing only in vapor at ordinary temperatures, be anæsthetics themselves, and if so, may their use as such be not an altogether impractical idea ?*

From what is known of the volatile liquids got from wood and

* For instance, may not their saturated solution in alcohol, in which they are readily soluble, give a ready method of obtaining their use as anæsthetics?

coal tars and bituminous minerals, these naturally suggest themselves as cheap and ready sources of the hydride of amyle, but from these it does not appear to us that it could be obtained in a sufficient state of purity as an anæsthetic, even though it may be found to form one of their ingredients.

Moreover, the difficulty of separating it from other ingredients, either by fractional distillation or otherwise, would be so great that success would be obtained at too costly a rate ; and, after all, we fear the hydride of amyle would hardly fail to repel by the taint attaching to it from such sources.

With a view of getting quit of the expense of the iodine, which, however, can be recovered, we thought of trying the chloride in place of the iodide of amyle, but completely failed in getting the hydride from it, although the digester was subjected to the same heat as the iodide, and for double the time. On removing the preserve from the plug, after proper cooling, an escape of gas took place with a loud report, showing the presence of an uncondensable gas, most probably hydrogen ; and on subjecting the contents to distillation, nothing came over till the heat reached the boiling point of the chloride, when nearly the whole of it distilled : besides, the zinc, instead of being matted together, as in the case of the iodide, by the formation of oxyiodide of zinc, was found in the tube quite loose.

In making the iodide of amyle, when the fusel oil has been nearly saturated with iodine, a solid crystalline matter separates, which becomes more abundant on the cooling of the liquid. So far as we have examined the compound, it seems to be a subiodide of phosphorus. It fumes strongly on exposure to the air, and on throwing it, after being firmly pressed in blotting paper, into a glass tube containing water, a hissing like red-hot iron in water is produced, and on applying a light to the escaping gas, it takes fire and burns with a brilliant phosphorus flame, and gives abundant white fumes of phosphoric acid, and leaves a red crust of suboxide of phosphorus (?) on the mouth of the tube. The gas appears to be phosphuretted hydrogen. The water on examination was found to contain hydriodic and phosphoric acids. Heated in a test tube it melts at a low heat and boils, giving a sublimate, which condenses in crystals nearly colorless on the sides of the tube. On applying a light to it in the open air it takes fire,

burning with a weak flame and the production of a violet colored smoke. Further investigation into its nature has meanwhile been prevented by falling short of material.—*London Phar. Jour.* June 1, 1857.

PARCHMENT-PAPER.

At a meeting of the Royal Institution, held on Friday, the 3rd of April, the subject of the discourse delivered by the Rev. J. Barlow, Vice-President and Secretary to the Institution, was “*On some modifications of woody fibre and their applications*,” in the course of which an interesting description was given of the substance to which the name *Parchment-paper* has been applied. This substance is the invention of Mr. W. E. Gaine, C. E., by whom the process for its preparation has been patented. Mr. Barlow having described several of the applications of woody fibre, and particularly its application in the manufacture of paper, referred to the chemical and physical changes effected in paper and analogous fabrics by treating them with chemical agents. He contrasted with the pyroxyllised textures of Kuhlmann and the gun-paper of Pelouze, the woven fabrics subjected to Mercer’s process, and the *Parchment-paper*, the invention of Mr. Gaine. By acting on cloth with chloride of zinc, tin, or calcium, with sulphuric and arsenic acid, and, especially, by the caustic alkalies in the cold (the temperature sometimes being lowered to -10° Fahr.), Mr. Mercer has obtained many important effects on the fineness and general appearance of cloth, and its susceptibility of dye. This subject was brought before the Royal Institution by Dr. Lyon Playfair, C.B.,* and it has since been closely investigated by Dr. Gladstone.† Mr. Mercer also experimented on the effect of acids on paper. It being known that sulphuric acid, under certain conditions, modified vegetable fibre, Mr. Gaine instituted a course of experiments to ascertain the exact strength of acid which would produce that effect on paper which he sought, as well as the time during which the paper should be subjected to its action. He succeeded in discovering, that when paper is

* *Proceedings of the Royal Institution*, vol. i., p. 134 (1852.)

† *Journal of the Chemical Society*, vol. v., p. 17 (1853.)

exposed to a mixture of two parts of concentrated sulphuric acid (s. g. 1.854, or thereabouts) with one part of water, for no longer time than is taken up in drawing it through the acid, it is immediately converted into a strong, tough, skin-like material. All traces of the sulphuric acid must be instantly removed by careful washing in water. If the strength of the acid much exceeds or falls short of these limits, the paper is either charred, or else converted into dextrine. The same conversion into dextrine also ensues, if the paper be allowed to remain for many minutes in the sulphuric acid after the change in its texture has been effected.

In a little more than a second of time, a piece of porous and feeble unsized paper is thus converted into the *Parchment-paper*, a substance so strong, that a ring seven-eighths of an inch in width, and weighing no more than 23 grains, sustained 92 lbs.; a strip of parchment of the same dimensions supporting about 56 lbs. Though, like animal parchment, it absorbs water, water does not percolate through it. Though paper contracts in dimensions by this process of conversion into *Parchment-paper*, it receives no appreciable increase of weight, thus demonstrating that no sulphuric acid is either mechanically retained by it, or chemically combined with it. It has also been ascertained by analysis, that no trace of sulphur exists in the *Parchment-paper*. The fact of this paper retaining its chemical identity, constitutes an important distinction between it and the gun-papers of Pelouze and others. Unlike those substances, it is neither an electric, nor more combustible than unconverted paper of equal size and weight, nor soluble in ether or potash. Unlike common paper, it is not disintegrated by water; unlike common parchment, it is not decomposed by heat and moisture. In this remarkable operation, the action of the sulphuric acid may be classed among the phenomena ascribed to catalysis (or contact action). It is, however, conceivable that this acid does at first combine with the woody fibre, with or without the elimination of oxygen and hydrogen, as water; and that this compound is subsequently decomposed by the action of water in mass, during the washing process, the sulphuric acid being again replaced by an equivalent of water; for as has been before stated, the weight of the paper remains the same before and after its conversion. Mr. Warren de la

Rue and Dr. Müller are engaged in researches on this subject, which will be hereafter published.

Those who are interested in chemical inquiry will recall many instances of physical changes occurring in compound bodies, while these bodies retain the same elements in the same relative weights. The red iodide of mercury is readily converted by heat into its yellow modifications; yet, by the mere act of being rubbed, it is made to resume its former color. Nothing is added to or taken from this substance in the course of these changes. The inert and permanent crystals of cyanuric acid are resolved by heat into cyanic acid—a volatile liquid, characterized by its pungent and penetrating odor, and so unstable that, soon after its preparation, it changes into a substance (cyamelide) which is solid, amorphous, and destitute of all acid properties. These substances, as well as fulminic acid (which, however, is known in combination only), contain carbon, nitrogen, oxygen, and hydrogen, in the same relative proportion. But the closest analogy to the production of *Parchment-paper*, scientifically considered, is perhaps afforded by what is called “the continuous process” in etherification. It will be remembered that, in this process, sulphuric acid, at a temperature of 284° Fah., converts an unlimited quantity of alcohol into ether and water. In the first stage of this process, as explained by Williamson, it would appear that the sulphuric acid combines with the elements of ether to form sulphovinic acid; and that, in the further progress of the operation, this compound, by coming into contact with a fresh equivalent of alcohol, is, in its turn, decomposed, and resolved into ether and sulphuric acid. The ether distils over together with the water resulting from the decomposition of the alcohol; the sulphuric acid remains in the retort, ready to act on the next portion. Here, as in the case of the *Parchment-paper*, the sulphuric acid does not form a permanent constituent of the resulting substance, though it takes so important a share in its production.

The strength of this new substance before alluded to, and its indestructibility by water, indicate many uses to which it may be applied. It will probably replace to some extent vellum in bookbinding; it will furnish material for legal documents, such as policies of insurance, scrip certificates, &c.; it will take the place of ordinary paper in school-books, and other books exposed

to constant wear. Paper, after having been printed either from the surface or in intaglio, is still capable of conversion by Mr. Gaine's method; no part of the printed matter being obliterated by the process. *Parchment-paper* also promises to be of value for photographic purposes,* and also for artistic uses, in consequence of the manner in which it bears both oil and water-color. It is about to be introduced into commerce by Messrs. Thomas de la Rue and Co.—*London, Pharm. Jour. June 1, 1857.*

METHOD OF PREPARING LACTATE OF ZINC. FORMULÆ FOR ITS EMPLOYMENT.

By DR. HERPIN.

Lactate of zinc has not hitherto been used in medicine. Dr. Herpin has recently shown the advantages which may be derived from its use in the treatment of epilepsy; we shall extract from his memoir the facts relative to the preparation and properties of the salt.

Lactate of zinc may be obtained, 1st, by the saturation of lactic acid; 2nd, by double decomposition.

First Process.—Lactic acid is put in contact with pulverised zinc. The metal dissolves, and lactate of zinc is formed, with a disengagement of hydrogen. Lactic acid may likewise be saturated by oxide of zinc, or better still by the carbonate of this base, both being freshly precipitated and carefully washed. In the latter case, when once the disengagement of carbonic acid ceases, so as to saturate every trace of acid, it is boiled and filtered; on cooling, it deposits crystals of lactate of zinc.

They only require one or two crystallisations to obtain a perfectly pure product.

Second Process.—The preparation of lactate of zinc by double decomposition necessitates two distinct operations; the first consists in transforming lactate of lime into lactate of potassa; the second in putting together lactate of potassa and acetate of zinc to obtain lactate of zinc.

When a solution of lactate of lime is precipitated by carbonate of potassa, carbonate of lime is deposited and the liquor contains

* Photographs on this paper were exhibited.

lactate of potassa, which is separated by filtration. The carbonate of potassa should be in excess, and the precipitate carefully washed, so as to extract the last traces of soluble lactate. On saturating the excess of carbonate of potassa with lactic acid, we obtain by evaporation pure lactate of potassa, in deliquescent crystallised masses, soluble in alcohol. But for the preparation of lactate of zinc, it is not necessary to use so pure a product; it is only necessary to take a liquid containing at once the lactate and carbonate of lime, produced by the precipitation of the lactate of lime; by pouring it in excess, without heat, into a concentrated solution of acetate of zinc, it forms a precipitate of lactate and carbonate of zinc.

After having collected this mixture it is subjected to pressure; it is treated with distilled water, and by filtering while hot, the insoluble carbonate is easily separated from the lactate of zinc which remains in solution. The liquor is evaporated and crystallised, and the salts obtained are purified by fresh crystallisations. If we are careful in the two successive operations to use the carbonate of potassa and the lactate of the same base in excess, we shall have no reason to fear the presence of any salt of zinc besides the lactate.

The lactate of zinc is most frequently found in the form of white plates, formed by the union of small prismatic crystals of four sides, terminated by summits truncated obliquely. It is inodorous, of a slightly saccharine taste, afterwards styptic. It is sparingly soluble in water, at the ordinary temperature; in fact it requires to dissolve it, sixty times its weight of water. It is, on the contrary, very soluble in hot water, for it dissolves in six times its weight of boiling water.

Lactate of zinc is insoluble in alcohol; this property may be made available in its separation from the acetate of the same base. On treating two alcoholic solutions of lactate of potassa, and acetate of zinc with each other, we obtain instantaneously a precipitate of lactate of zinc.

The medical properties of lactate of zinc had not been ascertained, when Dr. Herpin undertook the study of this salt. The stability of composition and the solubility of this compound, have induced him to substitute lactate of zinc for the oxide, in the treatment of epilepsy.

He prescribes it in the following forms:—

1st. In powder.

Pulverised lactate of zinc . . 1 to 16 grammes.

Pulverised sugar of milk . . 5 “

Forming 20 doses—three each day.

2nd. In pills.

Pulverised lactate of zinc . . 1 to 16 grammes.

Syrup of gum q. s.

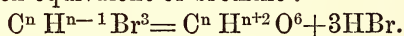
For 20 to 40 pills—three to six each day.

Chemist, June 1857, from Journ. de Pharm. et de Chimie.

ON THE ARTIFICIAL FORMATION OF GLYCERINE.

By A. WURTZ.

In a note on acetal and the glycols, the author put forward the opinion, that the processes adapted to cause the synthesis of the glycols, or diatomic alcohols, ought also to lead to the formation of the glycerines or triatomic alcohols. A glycerine is, in fact, derived from a bromide of carbonated hydrogen, $C^n H^{n-1} Br^3$, by the substitution of an equivalent of oxygen and an equivalent of water for each equivalent of bromine:—



These bromides may be prepared in various ways, and by taking advantage of the powerful affinity of bromide for silver, the above substitution may be effected.

The compound $C^6 H^5 Br^3$ may be prepared in three ways. One of these consists in treating iodide of allyle, $C^6 H^5 I$, or iodized propylene of Berthelot, with bromine. The iodized liquid is placed in a long-necked flask, surrounded by a refrigerating mixture, and one and a half times its weight of bromine is added in small quantities. The iodine separates in a crystalline form, whilst 3 equivs. of bromine are fixed upon the group $C^6 H^5$.

The tribromide thus obtained, when properly purified, forms a dense colorless liquid, which is slightly rose-colored if it retains a trace of iodine. At a temperature below $50^\circ F.$ it crystallizes in fine colorless prisms, which fuse at $61^\circ F.$ It distils unaltered at 422° – $423^\circ F.$ 205 grms. of acetate of silver were treated with 115 grms. of this tribromide, dissolved in 5 or 6 times its volume of crystallizable acetic acid. The paste thus

formed was heated for eight days on the oil-bath to a temperature of 248° – 257° F. On the conclusion of the reaction, the contents of the flask were thrown upon a filter, and the bromide of silver washed with ether.

The liquid was distilled until the thermometer marked 284° F.; the residue was treated with lime and ether. The colorless ethereal solution, when evaporated on the water-bath, left 15.5 grms. of a neutral yellowish oil. This was distilled, when a few drops only passed at 482° F., and the greater part of the liquid passed at 532° F. The perfectly colorless product is neutral, possesses a slight odor of acetic acid, and is heavier than water, at the bottom of which it forms an oily stratum. When agitated with a great excess of water, it dissolves. It is soluble in all proportions in alcohol and ether. It contains—

	Found.	$C^{18} H^{14} O^{12}$.
C	49.12	49.5
H	6.60	6.4

The formula $C^{18} H^{14} O^{12}$ is that of triacetine. The product analysed really contained 3 equivs. of acetic acid and 1 equiv. of glycerine. 0.647 gr. of the artificial triacetine were saponified by baryta-water. The liquid was freed from the excess of baryta by a current of carbonic acid and distillation, and precipitated by sulphuric acid. 0.974 gr. of sulphate of baryta was obtained, representing 2.8 or 3 equivs. of acetic acid.

To obtain artificial glycerine, triacetine was saponified by baryta-water, and the liquid freed from the excess of baryta was evaporated to dryness. The residue was treated with absolute alcohol containing a small quantity of ether. The liquid, evaporated *in vacuo*. At about 392° F. a very thick colorless liquid, of a distinctly saccharine taste, passed; it was soluble in all proportions in water and alcohol, but insoluble in ether. This liquid gave on analysis C 38.5, H 8.6. The formula $C^6 H^8 O^6$ requires C 39.1, H 8.6. To verify its identity with glycerine, it was treated with iodide of phosphorous, PI^2 ; a very brisk reaction took place, and iodized propylene was obtained.

The tribromide, $C^6 H^5 Br^3$, fusible at 61° F., and boiling at 422° to 423° F., is not identical with tribromhydrine. According to Berthelot's experiments, this is a colorless liquid, fuming slightly in the air, and distilling at about 356° F. But if the

solid tribromide gives a glyceric compound by reacting upon acetate of silver, this must be attributed to a molecular alteration taking place at the moment of the reaction.—*Comptes Rendus*, April, 1857, and *Chemical Gazette*, June, 1857.

THE MANUFACTURE, IMPURITIES, AND TESTS OF CHLOROFORM.

By EDWARD R. SQUIBB, M. D., U. S. Navy.

Assistant Director U. S. Naval Laboratory, New York.

The importance of an outline knowledge of the manufacture, properties, and tests of medicinal preparations, is probably not fully appreciated by the medical profession at large, and thus the chemistry and pharmacy of the *art* of medicine are gradually, but certainly, lost sight of in the rapid progress of the science.

If it be true, that the aim and object of medical progression is to improve the art of medicine in its application, then the practice of chemistry and pharmacy is as important in its bearing upon that progress as any other element. As physiology and pathology afford the light by which alone the indications and operations of vitality are seen and understood, so chemistry and pharmacy furnish the means by which these operations are modified or controlled. If scientific research and development be necessary to the successful practice of an art, the use of appropriate materials and tools is equally so. Hence it is argued that no scientific research can actively advance the practice of legitimate medicine if it does not embrace and scrutinize the materials and means by which the results are sought to be obtained.

As the demand for medicinal substances increases, the preparation of them is transferred by the physician to the dispensing pharmacist, and then by the latter to the manufacturer of chemicals on the large scale. These substances then take their places in the common market as articles of commerce, and are bought and sold with as little relation to their ultimate effects as other merchandise, while their character and quality are far less easily judged of or ascertained. Under such circumstances these substances now-a-days, deserve much more

earnest attention at the hands of those who use them. Chemistry receives but a small share of the attention of medical men; first, because it has become an abstruse, complicated, and subdivided science, whose advances are too rapid for collateral comprehension; and secondly, because the manufacture of chemicals on the large scale is supposed to have taken charge of that speciality, and to furnish the necessary scientific research and knowledge, thus relieving the physician of this important tax upon his time and intellect, and at the same time furnishing his implements in the desired quantity and condition. But it so happens that the scientific research and accumulating knowledge in all branches of manufacture are rather in the direction of large profits than improved therapeutics, and therefore, practically, the profession of medicine in tacitly relieving itself of the necessity for chemical and pharmaceutical knowledge, has suffered its *materia medica* to be debased, and neglected the means of check and control.

It is abundantly demonstrated by daily experience that more chemical research and labor are now required to discriminate between good and bad medicinal substances, than for the proper preparation of most of them, while many, from their character, defy all proper scrutiny. For instance, it is far easier to make medicinal hydrocyanic acid, than to ascertain the strength or purity of an unknown sample, while such substances as compound extract of colocynth can never have their value determined by examination. Again, from this want of knowledge, research, and attention on the part of the physician, it happens, as in the case of Chloroform, that simple discriminative tests follow the introduction of important substances at so long intervals that the true value of the substance is lost, or much impaired, through its undetected impurities.

Of the number of pharmacutists in the United States, the proportion of those who make their own most simple chemical preparations is very small, while of the physicians who test and examine the preparations they use, the proportion is perhaps still smaller. The physician relies upon his pharmacist, and the pharmacist relies upon the manufacturer, and thus the ultimate source of supply is not only removed beyond the confines of the profession, but beyond the reach of professional in-

fluence, except through discriminations and rejections of the articles supplied.

These are some of the prominent conditions upon which a medical skepticism, in the community and profession, is so steadily gaining ground, and therefore, the bad condition and prospects of the *materia medica* deserve the most serious attention from all medical men. Uncertainty in medicine is proverbial, and the rapid progress in the science has not had the effect of diminishing duly the force of the proverb in the community at large; for the slowly increasing confidence of the educated portions of the community is not proportionate to the advancement in knowledge and skill in the profession. In view of these circumstances, the writer would respectfully urge upon this association the importance of the question, as to how far the bad and uncertain quality of medicinal substances as now commonly used enters into this result,—and whether the modern reading of the proverbial uncertainty should not be directed against the implements of the art, rather than against the science.

In the failure of medicinal substances to fulfil the indications for their use, let the medical man more frequently call in question the character or quality of the agent than the sufficiency of the principles upon which the use was based.

With such claims upon this association for its interest and indulgence, the following matter is volunteered as information on the manufacture, properties, tests, and application of what is regarded as purely medicinal chloroform.

Forty pounds of chlorinated lime, previously made into a paste with water and passed between wooden rollers, is introduced into a forty gallon wooden still or barrel, and then diluted to the volume of fifteen gallons with water or chloroform washings. This mixture is then heated and agitated by the direct application of steam through a perforated pipe till the temperature rises to 145° . Four pints of alcohol are then blown into the mixture with the current of steam, and the heating continued till the temperature is about 145° , when the steam is shut off entirely and the mixture abandoned to its own reactions. Upon auscultating the still, a perfect vesicular murmur is heard. This increases gradually to active frothing ebullition, yielding vapors of chloroform, undecomposed alcohol, chlorine, hydrochloric, and

acetic acids, acetic ether, aldehyde, chloride of ethyl, chloral, &c. The remainder of the process, and that in which almost all the imperfections lie, has for its object the separation and condensation of the chloroform, and the utilization of the residues. The mixed vapors are passed together into a leaden vessel arranged as a Wolf's bottle, and there made to bubble through milk of lime kept at a temperature of about 205° . Here the watery vapor, chlorine, hydrochloric acid, and some of the chlorinated compounds, are for the most part condensed or combined, while the more volatile substances, among which are the chloroform and alcohol, pass on to the first condenser or cooler. The water around the worm of this cooler is kept nicely regulated at about 165° , so that in it much of the vapor of water yet remaining, and almost all the alcohol vapor, is condensed and abstracted, leaving the vapor of chloroform to pass on to the final condensers in a state tolerably pure. These final condensers are supplied with cold water, and in them the remaining condensable vapors are brought to the liquid condition. The product of crude chloroform at this stage is about thirty-six fluid ounces.

During this part of the process the contents of the still occasionally froth up, and would pass over with the vapors except for the arrangement of a cribriform cup of lead at the top of the still, inside, whereby a fine shower of cold water from a hose faucet is made to fall upon the frothing mixture.

Steam is then admitted to the still again, and the distillation continued, after the impure chloroform has ceased to separate, until the distillate no longer contains any traces of alcohol or chloroform. This weak distillate is used instead of water, to dilute the succeeding charge.

The crude chloroform is then washed three times with an equal volume of cold water, to deprive it of alcohol, acetic acid, &c., and set aside till the product of several charges is accumulated. It is then shaken with an equal volume of a dilute solution of carbonate of soda to free it from traces of chlorine, and at the end of the process, is finished by rectification from a mixture of slaked and quick lime, in a glass apparatus. The washings, except those of carbonate of soda, with the liquid condensed in the cooler, and, every third charge the contents of the lime purifier, are added to the succeeding charge, and in this way

seven charges are worked off from the apparatus each day during the process.

The chlorinated lime or "bleaching powder," for this process, reacts in virtue of, and in proportion to the hypochlorite of lime it contains; and the chlorine of this hypochlorite, which is the ultimate effective reagent, varies in general between twenty-four and thirty per cent. of the whole weight. Occasionally there is as much as three or four per cent. variation in the proportion of chlorine in the contents of the same cask, through long keeping, carelessness or design in the manufacturing, the chlorine being the expensive element.

The alcohol for this process should be highly rectified, because in this rectification, up to ninety-one per cent. for instance, it must necessarily be freed to a great extent from the grain oils and other impurities whose reaction with chlorine produce deleterious compounds.

Manufacturers on the large scale, who too often take purity of product into their scheme as collateral, use in this process whiskey, or spirits that have been recovered from other processes, as extraction of alkaloids, &c., which are cheap, but are of course filled with foreign substances, whose reaction, with chlorine, cannot be prevented nor determined. In this way, notwithstanding the assertions that have been made to the contrary, there can be little doubt that many deleterious compounds are produced in the process, and pass with the chloroform (no lime purifier being used) not only into the market where the profits are realized, but also into the lungs of the patients, and by reflection affect injuriously the credit and character of the medical profession.

These deleterious compounds are exceedingly subtle, and like many hydrocarbon compounds, are often produced in groups. From the looseness of their affinities, they are so delicate and so easily modified in character and composition, that they may be more or less noxious in a proportion that it is impossible to determine, even at different ages, of any given sample. From these circumstances it happens that they are very difficult to separate or determine; but fortunately they are not difficult to detect. If they ever occur in chloroform made properly, and from good materials, it must be very rarely, and in proportions too minute

to be hurtful. A trace of acetic ether is often present in very good chloroform, even to an extent perceptible in the odor, but it is not at all hurtful in such proportion. Chlorinated lime containing twenty-seven per cent. of chlorine or hypochlorite, will yield, with the above process and management, seven per cent. of its weight in pure chloroform. And the alcohol used will yield ninety-two per cent. of the weight of the absolute alcohol it may contain; or alcohol of ninety-one per cent. will yield 83.7 per cent. of its weight of finished chloroform.

The writer avoids in this place, as foreign to the intended practical and medical character of this paper, all discussion of the theory and reactions of the process. It is sufficient to say that chloroform is generally regarded as a terchloride of formyle, and has the ultimate formula $C_2, H. Cl_3$. The chemically pure chloroform as represented by this formula should practically be associated with a little alcohol, and perhaps water, in order that it may keep well without troublesome precautions. That produced by the above process contains a little water, but is almost chemically free from alcohol, and as produced is liable to slight decomposition with the production of free chlorine. Hence it is useful and proper to add a small proportion of ordinary alcohol, so that the s. g. may be reduced from 1.498 to the officinal standard, namely, 1.49, or at least to 1.494.

The writer is convinced by observations upon chloroform made by himself, that a tendency to decomposition becomes very strong when chloroform has a purity indicated by a density above 1.497, and that decomposition will be almost inevitable when the density is above 1.498, and he believes that this circumstance explains the fact that chloroform which has been purified with concentrated sulphuric acid alone, rarely keeps well, although known then to be almost chemically pure. The acid abstracts not only the impurities as such, but also the last portions of water and alcohol. Then when a single point of decomposition is determined by light or other incitant to chemical reaction, that reaction proceeds as in a process of fermentation until the whole is decomposed. The small proportion of alcohol may prevent this in many ways, but probably by closing the circuit of the composition of the compound as the circuit of the magnet is closed by its keeper, or as the decomposing forces

of some acids are controlled by combination. Thus, if the balance of affinities is disturbed in the direction of decomposition, the disturbing forces being equally efficient for recomposition when material is present in the proper condition—alcohol, the original matrix being present, the chain is again closed and complete.

With regard to the effect of sulphuric acid, it is true that the best manufacturers in Edinburgh, where perhaps chloroform is best made and most used, do purify their product with the acid, but then they distil it from the acid after having combined the latter with baryta. Thus after the acid has performed its office of destroying all the impurities, it is, in effect, prevented from carrying off with it the last portions of alcohol and water, by having presented to it a substance for which it has a superior affinity, and for which it abandons the alcohol and water, and these latter are again seized by and carried over with the chloroform. This process of purification has been long used, and is probably unobjectional in effect. It is, however, not better than that above given, while it is far more troublesome and expensive.

The risk of decomposition from too high density is, however, one of the very least that commercial chloroform has to encounter, for where one specimen is found to be above 1.49, hundreds are found below it. Indeed, it is very rare to meet with a specimen whose density is above 1.49, the greater number by far being about 1.46 to 1.48. Low specific gravity alone, however, does not render the preparation noxious or bad, as is shown by the common use of a tincture of chloroform. Yet, when of a low specific gravity, it is almost invariably bad, from the simple fact that the manufacturer in leaving it thus, must leave other impurities in it which would have been in great measure removed by the washings required to free it from alcohol.

In short, the bad effects which are attributed to chloroform, and which have brought upon this anæsthetic a large share of the distrust in which it is held, are, in the opinion of the writer, due to the presence in it of foreign deleterious compounds, which are the result of faulty preparation and bad materials.

Fortunately these deleterious compounds may be easily detected, and by very simple means within the reach and practice of every one who can have occasion to use chloroform ; and every

specimen that is used should be subjected to the scrutiny. Some such simple tests for each important preparation of the *materia medica*, well known and freely applied by the physician, is what is now most needed by the profession. But the profession should not depend upon the knowledge and research of the chemical manufacturer for the discovery and application of such tests, for very obvious reasons.

When equal volumes of chloroform and pure concentrated sulphuric acid are shaken together, and then allowed to separate, there should be no odor, or but a mere faint tinge of color imparted to the acid, and there should be no heat developed in the mixture. Any chloroform that will satisfy these simple conditions, may be considered pure, and may be used with confidence, while all that will not, should be unequivocally rejected. In the use of this simple and easy test, the indication of color has relation to the deleterious impurities, and that of temperature to the specific gravity or dilution, for if any water or alcohol be present their combination with the acid produces rise of temperature. Chemically pure chloroform, when thus shaken with the acid, produces no sensible effect upon either. The chloroform of the process given, causes a faint tinge of color in the acid after prolonged and vigorous shaking, and produces a rise of temperature in the mixture of seven or eight degrees, not perceptible to the hand. The amount of heat developed may be conveniently noted by observing the force with which the stopper is thrust outward on removing it, for the rarefaction of the air contained with the mixture will produce a pressure upon the stopper exactly in proportion as it is warmed by the mixture. Differences in temperature not perceptible to the hand, may be detected in this way if the necessary precaution is observed to avoid the influence of the warmth of the hand in shaking the bottle. A thermometer introduced before and after the shaking is, however, more accurate and reliable, when accuracy is necessary.

This is by no means the only qualitative test for chloroform, but as it is the most simple and easy, and is practically reliable, it is useless to occupy time and attention with others. Few samples of chloroform as ordinarily found now, will meet the requirements of this test, and yet the preparation is generally much better than it was four or five years ago.

The slow decomposition before alluded to as liable to occur in chloroform of high density, is easily detected, first, by the odor of chlorine, which is more strongly marked on first opening the bottle,—and again, by suspending moistened blue litmus paper in the bottle above the liquid. This decomposition commences, and in most cases is limited to the vapor above the liquid. When it has seriously affected the liquid chloroform, there is little danger but that the specimen will be rejected, for the odor of chlorine is then so strong and pungent that it becomes almost impossible to inhale the vapor. Chloroform that is undergoing the slow decomposition from too high density alone, may give no acid or bleaching reaction with litmus paper, when immersed in the liquid, nor more than the faintest possible cloudiness when shaken with solution of nitrate of silver, but if a piece of moistened litmus paper be suspended in the vapor within the bottle, it first becomes of a reddish tinge, about the edges first, and is then more or less bleached, or turned of a dingy white color. Test paper so suspended becomes more or less red within half an hour, in almost all samples of good chloroform that has been long kept, but is never bleached unless decomposition is going on. This distinction of reaction is important, and affords very clear indications. In ordinary commercial chloroform of low density, the vapor above the liquid is rarely acid, even when the liquid itself is so. When very delicate shades of acid reaction are to be detected, the strip of blue litmus paper should be torn rather than cut at its free extremity, and the reaction looked for upon the projecting fibres of the torn edges.

It has been before stated that the addition of a small portion of alcohol prevents the decomposition of good chloroform. The addition of alcohol also arrests this decomposition, even after it has gone on for many weeks, but it does not of course free the remaining chloroform from the products of the decomposition. In this case a new rectification is required to separate the watery looking fluid which is produced, and either adheres to the bottle about the edges of the surface of the chloroform, or is diffused through it, rendering it opalescent. The appearance of this liquid on the addition of alcohol is an unfailing test of the condition of the chloroform in this respect. New rectification from powdered quick-lime separates this fluid, and renovates the chloroform entirely.

The addition of eight drops of alcohol to each fluid ounce of decomposing chloroform, or .53 per cent. of its weight, is the minimum proportion which has been successfully used, though this is not probably the limit in that direction. Such an addition, namely, .53 per cent., reduces the s. g. by .0055, or reduces chloroform of s. g. 1.4989 to s. g. 1.4934. A better proportion of alcohol is, however, 10 drops to each fluid ounce, or .66 per cent., reducing the s. g. by .0069, or from 1.4989 to s. g. 1.492.

The writer has on two occasions, at least, administered without any unusual effect, chloroform that gave an acid reaction not only with suspended litmus paper, but also with that which was immersed in the liquid. But it was first ascertained by solution of nitrate of silver, that the acid was not hydrochloric.

He has also used portions that were undergoing slow decomposition, as indicated by the bleaching effect upon suspended litmus paper, and equally without bad effects.

These circumstances greatly strengthen the position assumed, that it is not chloroform, nor its legitimate elements or constituents, that produce the bad effects, but foreign substances of very different nature and composition.

The specimens before the Academy are :—

First. Chloroform that is undergoing the slow decomposition. S. G. 1.4989. This is the product of the described process, without the addition of alcohol.

Second. A portion of the same chloroform in which the decomposition has been arrested by the addition of .66 per cent. of alcohol. The watery looking fluid and opalescence produced is distinctly visible. S. G. 1.492.

Third. A portion of the second specimen completely renovated by rectification from powdered quick lime. S. G. 1.492.

Fourth. Chloroform made at the same time, and by the same process as the first specimen, but of a little lower density, from being a later portion of the distillate in the rectification. This having undergone no perceptible change. S. G. 1.4984.

Fifth. Chloroform made in 1853, exhibiting the strongly acid reaction of the vapor, while the liquid is neutral, or very nearly so. S. G. 1.492.

Sixth. Chloroform in the condition ordinarily dispensed in the Navy. S. G. 1.492.

Seventh. The best of four samples of chloroform as supplied to the Navy prior to 1853. As these were always obtained from the best druggists, and commonly at high prices, they probably represent the best chloroform of the common market at that time. S. G. 1.474.

The suspended moistened litmus papers exhibit the vapor reactions in each, while the separated portions exhibit the characteristic reaction with sulphuric acid and the thermometer. The writer is under obligations to some members of the Academy, for the opportunity of exhibiting the effect of the tests upon specimens of chloroform from the best sources newly purchased, and not before seen or examined by the writer.

In the early part of the career of chloroform, it was not only very badly made, but was also badly applied, and without discrimination or proper limit, and that bad results followed is scarcely to be wondered at.

These circumstances enter largely in explanation of the fact, that of the sixty-five or six reported cases of death by chloroform, not more than three or four have been noticed as having occurred within three years, and not one very lately, while there is no evidence of abatement in its use within that time.

As there appears to be some tendency in the profession here, to take up and examine anew into the safety of chloroform as an anæsthetic, the following significant facts may be mentioned. There is no doubt that chloroform has always been, and is still very largely used in Great Britain; perhaps as freely and successfully as ether here, so that the number of cases in Edinburgh alone is now stated at over 200,000. The bona fide confidence in it, after so large an experience, is just now evinced by the circumstance of its having been administered to the Queen in her ninth parturition. If chloroform can be used there with the confidence and safety thus indicated, is it not probable that similar chloroform could be used with equal safety here?

Probably the strongest reasons why ether has been more safe than chloroform here, are,—first, that ether cannot be made from low grades of alcohol at all,—secondly, that the concentrated sulphuric acid destroys most of the impurities of the alcohol in the process of etherification,—and finally, that the manipulation of the ether process is easier, and the impurities less noxious.

Therefore bad ether may be justly considered more safe than bad chloroform, but that good ether is more safe than good chloroform, the writer does not believe.

As a corollary, therefore, it would appear that the practice of the profession has really been in the hands of the manufacturer, and it is the more to be regretted that in this respect chloroform stands by no means alone.

During the past five years the writer has made 187 pounds of chloroform for the Navy, most of which has been dispensed and used, and as yet without a single reported case of bad results. Within that time he has personally administered it for anæsthetic purposes twenty-two times, without any apparent hazard, and with the occurrence of no disagreeable consequences greater than nausea afterward, and this in one instance only. In the case of one old man, with shattered constitution and one hepatized lung, it appeared necessary to use it very cautiously; but its use was continued through 45 minutes with excellent effect.

This very limited experience in its application, inclines the writer to agree with those who regard the respiration rather than the circulation as the function to be most closely watched, as the index to its ordinary administration.

It has not been the object of this paper to cover the whole ground upon this subject, or to occupy the time of the Academy by a recapitulation of what is already well known from other sources. Its somewhat desultory character may, therefore, possibly be excused.—*American Medical Monthly, July, 1857.*

ON TESTING THE AMOUNT OF ACETIC ACID IN VINEGAR.

By J. OTTO.

Nicholson and Price have brought the process of determining the amount of acid in vinegar by neutralization by alkalies or alkaline carbonates, into disrepute. They state, that very inaccurate results are obtained, because the alkaline acetate has an alkaline reaction; and that the testing must be effected with carbonate of lime or baryta, or by means of the carbonic acid apparatus of Fresenius and Will. They found these statements upon experiments, the results of which are summoned up in what follows. The numbers indicate the per-centage of hydrated

acetic acid, which was found by the various methods of testing in concentrated or dilute acetic acid.

Carbonate of Soda.	Carbonate of lime.	Carbonate of baryta.	Fresenius & Will's Method.
87.9	99.6	99.4	99.3
45.3	52.8	52.3	52.0
22.1	25.5	25.7	25.3

How different are the numbers of the first series from the corresponding numbers in the others, in which the greatest accordance is exhibited!

The experiments of Nicholson and Price were exceedingly unwelcome to me, as I was just engaged in the preparation of a new edition of my Text-book of Vinegar Manufacture. I should have to condemn the former method in general use, for the determination of the amount of acid in vinegar, as well as my acetometer, in which a dilute ammonia is used as the acetometric fluid. Not so much to check the correctness of the experiments in question, which appeared to me to be beyond a doubt, as to see whether, in the case of an acetic acid so diluted as the vinegars, the error was not so small that it might be passed unnoticed, or whether it was not constant in amount, I made a few experiments. I will communicate these in the following. The numbers represent centesimal parts of anhydrous acetic acid in the vinegar examined.

Acetometer.	Carbonate of soda.	Carbonate of baryta.
6.3	6.5	6.2*
9.1	9.2	9.0

The acetometric ammoniacal fluid was prepared with the greatest exactitude.

For testing with carbonate of soda, a normal solution of the anhydrous salt containing 104 grms. in the litre was employed, and a Mohr's burette was used. 5 cub. cent. of the solution indicate 1 per cent. of acetic acid in 50 grms. of vinegar. The point of neutralization was ascertained in the heated vinegar by means of pale blue litmus paper.

In testing with carbonate of baryta, a weighed quantity of the salt was put into a weighed quantity (10 or 50 grms.) of vinegar, and digested therewith, at last at a high temperature, until the solution produced had an alkaline reaction. For this purpose a long time was required. The undissolved carbonate of baryta

* In two perfectly concordant experiments.

was collected on a filter, carefully washed, dried, calcined and weighed. 98.5 of carbonate of baryta, represented 51 of acetic acid (1 equiv.)

It might be objected against these experiments, that possibly I did not continue the digestion of the vinegar with the carbonate of baryta long enough, for there is no other means of judging of the completion of the digestion, except the reaction. For this reason I made the following experiments, which must remove all doubt, and which may easily be repeated in a few minutes.

27 grms. of crystallized acetate of soda were dissolved to form 100 grms. of solution. This solution contained 10 grms., or 10 per cent. of acetic acid. It had an alkaline reaction with reddened litmus paper. It was rendered perfectly neutral by 2 cub. cent. of vinegar, containing 4.5 per cent. of acid, and the addition of 1 cub. cent. more vinegar caused it to react distinctly acid upon blue litmus paper; 2. cub. cent. of vinegar of 4.5 per cent. do not contain fully 0.1 grm. of acetic acid; the error, therefore, which results from the alkaline reaction of acetate of soda in the determination of the acidity of a vinegar of 10 per cent., can at the utmost only amount to $\frac{1}{10}$ th per cent., and is certainly always less, as a little too much soda is usually added.

A hot solution, containing 50 per cent. of acetate of soda, representing 18.7 per cent. of acetic acid, was rendered neutral by 2 cub. cent. of vinegar of 9 per cent., and distinctly acid by another cub. cent.

The process hitherto in use for the determination of the amount of acid in vinegar by means of alkalies or alkaline carbonates may therefore be retained, as it gives sufficiently accurate results; the alkaline reaction of the alkaline acetates does not affect the accuracy in a noticeable degree.

When, many years ago, I constructed the acetometer to which my name has been given, and by means of which the amount of acid in a vinegar is ascertained very conveniently and rapidly, and also very exactly if the acetometric fluid has been correctly prepared, I was obliged to make experiments as to the amount of ammonia in liquid ammonia of various specific gravities, and sketch out a table of them. Very recently, Carius has ascertained the amount of ammonia in solutions of ammonia in a very

different way (Liebig's Annalen, xcix. p. 129.) As appears from the following comparison, my table agrees so closely with that calculated by Carius, that it deserves perfect confidence for use in the preparation of the acetometric fluid.

Amount of ammonia in the fluid.	Specific gravity.	
	Carius.	Otto.
12 per cent.	0.9520	0.9517
11 “	0.9556	0.9555
10 “	0.9593	0.9593
9 “	0.9631	0.9631
8 “	0.9670	0.9669
7 “	0.9709	0.9707
6 “	0.9749	0.9745
5 “	0.9790	0.9783

Chem. Gaz., July 1, 1857, from Liebig's Annalen, April 1857.

EXAMINATION OF JAPANESE PEPPER, THE FRUIT OF THE XANTHOXYLUM PIPERITUM OF DE CANDOLLE.

BY JOHN STENHOUSE, L.L.D., F.R.S.

About three years ago, I published a cursory examination of Japanese pepper, and described a crystalline principle, to which I gave the name of Xanthoxylin, made with a specimen received from my friend Daniel Hanbury, jun., Esq. Having recently obtained a larger quantity of the same material, I was enabled to submit it to a more extended examination.

“Japanese pepper is the product of *Xanthoxylum piperitum*, De Cand., (*Fagara piperita*, Linn.), a tree of Japan of the natural order Rutacæ, figured and described by Kœmpfer, in 1712.

“It consists of roundish sessile capsules of the size of a peppercorn, which appear to have been nominally four in number, situated at the extremity of a peduncle, though but one or two are usually fully developed. The capsules, which are externally reddish brown, have their outer covering beset with numerous prominent tubercles, enclosing an acrid liquid, to which the pepper owes its pungent flavor. The seeds are black, shining, and devoid of pungency; from dehiscence of the capsules

they are generally wanting in the sample which we have examined.

"The flavor of Japanese pepper is aromatic and agreeable, with a pungency not unlike that of pellitory (*Radix pyrethri*). Its odor when bruised is remarkably fragrant.

"It is employed as a condiment by the Japanese and Chinese."

The seeds after being crushed in a mortar were distilled with water. The distillate consisted of water, containing a mixture of an oil and a crystalline solid body (Xanthoxylin) floating on its surface.

The oil and stearopten, having been removed from the water, was strongly cooled when the greater portion of the stearopten crystallized out, and was separated from the oil by filtration.

The Oil.—When the oil was submitted to fractional crystallization, the greater portion came over about 130° C., and was found to be free from stearopten. The portion remaining in the retort was transferred to a beaker, loosely covered by a piece of filter paper, and allowed to stand for several weeks, when a quantity of stearopten deposited. The crude oil boiling at 130° C., was well shaken and allowed to stand in contact with fused chloride of calcium to remove adhering moisture, then distilled off caustic potash, and afterwards rendered quite pure by being rectified off sodium and a small quantity of potassium.

The oil after having been purified in the manner above detailed had a constant boiling point of 162° C.

When burnt with oxide of copper in the gas furnace:

I. 0.192 grms. of oil gave 0.198 grms. of water, and 0.62 grms. of carbonic acid.

II. 0.191 grms. of oil gave 0.199 grms. of water, and 0.623 grms. of carbonic acid.

THEORY.	EXPERIMENT.	
	I.	II.
C ₁₀ = 60 — 88.23	88.00	88.02
H ₈ = 8 — 11.77	11.45	11.62
68 100.00		

From the above numerical results, it is evident that the oil is a hydrocarbon, isomeric with oil of turpentine. The pure hydrocarbon, to which I propose to give the name of Xanthoxylene, is colorless, refracts light strongly, retains its original extremely pleasant aromatic odor even after repeated rectifications, and does not undergo the alteration of odor which is usually exhibited by hydrocarbons obtained by the distillation of essential oils after treatment with sodium.* On saturating the oil with dry hydrochloric acid gas, and allowing it to stand for many days, no crystalline body was obtained, but a liquid combination with hydrochloric acid was evidently produced.

The Stearopten.—The crystalline body, or stearopten, which deposited on the surface of the water obtained by distilling the seeds with that liquid, which was also produced by the spontaneous evaporation of the crude oil boiling above 130° C., was purified by repeated crystallizations out of alcohol. The stearopten thus purified presented the form of large crystals of a fine silky lustre, and when analysed gave the following results :—

I. 0.2135 grms. gave 0.118 grms. of water, and 0.477 grms. of carbonic acid.

II. 0.252 grms. gave 0.139 grms. of water, and 0.563 grms. of carbonic acid.

III. 0.332 grms. gave 0.184 grms. of water, and 0.748 grms. of carbonic acid.

THEORY.	EXPERIMENT.				
	I.	II.	III.	IV.	N.
C ₄₀ = 60 — 61.22	60.88	60.91	61.11	61.09	61.09
H ₆ = 6 — 6.12	6.31	6.11	6.00	6.45	6.80
O ₄ = 32 — 32.66	—	—	—	—	—
98 — 100.00	—	—	—	—	—

The stearopten is insoluble in water, but readily soluble in alcohol and in ether. When quite pure it possesses a very slight

*The pleasant aromatic odor of Japanese pepper is due to Xanthoxylene.

odor resembling that of stearine, and its taste is slightly aromatic. It distils unchanged, the melting point before and after distillation being the same, namely, 80° C., and its solidifying point 78° C. An alcoholic solution of the stearopten added to alcoholic solutions of nitrate of silver and acetate of lead, even on the addition of ammonia, gave no precipitate—nitric acid converts the stearopten into oxalic acid.

In my former notice of Xanthoxylin, which, from the very small quantity at my command, I had endeavored to purify from adhering resin by washing it with ammonia, I found a minute trace of nitrogen, no doubt arising from the small quantity of ammonia adhering to the crystals.

When Xanthoxylin is perfectly pure, however, it is entirely devoid of nitrogen.—*Pharm. Journ.*, July 1, 1857.

ON A NEW SULPHIDE OF CARBON (CS).

By M. E. BAUDRIMONT.

As yet only one sulphide of carbon is known to exist, namely, CS_2 , corresponding to carbonic acid CO_2 . A protosulphide CS corresponding to carbonic oxide CO has never been obtained. It is the discovery of this compound which I have the honor of announcing to the Academy, and which has occupied me for several months. I propose at present to briefly indicate the the preparation and analysis of this new body, with some of its properties, and to reserve for a future occasion the complete account of its investigation.

Protosulphide of carbon may be obtained by the following processses:—

1st. By decomposing the vapor of ordinary bisulphide of carbon with spongy platinum, or with pumicestone heated to redness; under these circumstances the bisulphide is decomposed, an abundant deposit of sulphur takes place, which often chokes up the tube, and a gaseous body is formed, which is the protosulphide of carbon CS. This well-defined reaction is sufficiently explicit.

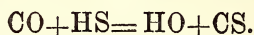
2nd. It is obtained simultaneously with the bisulphide when that body is prepared by the ordinary method.

3rd. By decomposing the vapor of CS_2 at a red heat with pure lampblack or wood charcoal, but especially with fragments of animal charcoal.

4th. By decomposing the vapor of the bisulphide with hydrogen at a red heat.

5th. By calcining sulphide of antimony with an excess of charcoal.

6th. By the reaction of carbonic oxide upon sulphuretted hydrogen at a red heat.



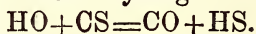
7th. By the reaction of sulphurous acid upon carburetted hydrogen at a red heat.

8th. By the reaction of carbide of hydrogen with chloride of sulphur at a red heat.

9th. It is produced during the decomposition of sulphocyanogen by heat, &c.

The first process yields the gas in a state of purity; but when obtained by other methods, it is contaminated with sulphide of hydrogen or carbonic oxide. It may, however, be purified from these by being rapidly passed through a solution of acetate of lead, chloride of copper dissolved in hydrochloric acid, and then drying the gas collected over mercury.

This body is gaseous, colorless and possesses an odor reminding one of ordinary sulphide of carbon, but not disagreeable, and strongly ethereal. Respired in any large quantity, it appears to be powerfully anæsthetic. It burns with a bright blue flame, producing carbonic acid and sulphurous acid. It resists the cold produced by a mixture of ice and salt. Water dissolves about its own volume of it, but the solution rapidly decomposes into sulphuretted hydrogen and carbonic oxide.



It is not more soluble in alcohol or ether.

The solution of chloride of copper does not absorb it. Solution of acetate of lead is not effected immediately, but, after some hours' contact, the liquor blackens, and the salt is completely transformed into carbonic oxide and sulphide of lead. In contact with solutions of the alkalies, potash, soda, &c., it is rapidly decomposed. With lime water, for example, the reaction gives sulphide of calcium and a volume of carbonic oxide, equal

to that of the gas employed. This remarkable reaction accurately establishes its composition $\text{CaO} + \text{CS} = \text{CaS} + \text{CO}$, no carbonate of lime being produced.

At a red heat it is feebly decomposed—1st, by a spongy platinum; 2ndly, by the vapor of water into HS and CO; 3rdly, very readily by hydrogen into HS and CH; 4thly, by copper into graphitoid carbon and sulphide of copper; and, finally, by exposure to the sun with an equal volume of chlorine, a reaction takes place, a partial condensation and formation of compounds, which I am at present investigating. Analysed by oxygen in the eudiometer, it gives equal volumes of carbonic acid and sulphurous acid, from which we may deduce the formula CS as representing its composition. The composition is also established by the action of lime water, which, as I have stated, resolves it completely into carbonic oxide and sulphide of calcium without the production of any carbonate of lime. We also arrive at the same conclusion from determining the quantities of carbon and sulphide of copper, produced by its decomposition with that metal.

Many chemists have attempted to discover this body; and its having escaped their investigations, is attributable, without doubt, to its reaction upon water and the solutions of the alkalis, which resolve it into carbonic oxide and sulphuretted hydrogen.—*London Pharm. Journal, July 1st, 1857, from Comptes Rendus.*

NEW METHOD OF DETECTING IODINE AND BROMINE.

By MM. O. HENRY, Jr., and E. HUMBERT.

The authors employed this process with the view of determining the presence of iodine in the waters of Vichy, in which its existence was a matter of dispute. It presents great analogy with that recommended by them for detecting traces of hydrocyanic acid in cases of poisoning, and is applicable in all possible circumstances. In the case of a mineral water it is as follows:—

The water (or the more or less concentrated residue of its evaporation) is treated with acid nitrate of silver. The pre-

precipitate formed must contain the chlorine, bromine, and iodine of the water. It is washed and carefully dried. It is then intimately mixed with a little cyanide of silver and introduced into a tube, at one end of which it is fixed between two plugs of wadding and abestos. A current of very dry chlorine is then passed slowly over the mixture, whilst the corresponding part of the tube is slightly heated. The iodine, bromine, and cyanogen are displaced, combine and condense in the colder parts in the form of a white crystalline ring of iodide and bromide of cyanogen. The tube is then closed at both ends, and may serve in case of need as a piece of evidence.

The physical and chemical properties of iodide and bromide of cyanogen do not allow them to be confounded with other compounds. The iodide sublimes at 113° , and the bromide at 59° F. This allows them to be separated mechanically by plunging the tube into water at 86° F. The iodide and bromide give the principal characteristic reactions of iodine and bromine.

Pure substances must be employed to furnish the chlorine required, and the apparatus should be set in action for some time before the commencement of the experiment. For this purpose cyanide of silver alone is put into the tube; if no trace of iodide or bromide of cyanogen sublimes, the operation may be proceeded with.—*London Chem. Gaz.*, June, 1857, from *Comptes Rendus*.

ON THE CONVERSION OF MANNITE AND GLYCERINE INTO TRUE SUGAR.

By M. BERTHELOT.

The analogies existing between the alcoholic fermentation of mannite and glycerine and that of the true sugars, at once give rise to the opinion that these two fermentations might not really be distinct; if mannite and glycerine furnish alcohol, they probably pass previously through the state of sugar.

To determine this question, the author has made various experiments, the results of which differed according to circumstances. Under the normal conditions of the alcoholic fermentation of mannite and glycerine, with the simultaneous influence

of carbonate of lime and caseine, their conversion into alcohol, either at 104° F. or at 50° F., takes place directly, without the least indication at any moment of the temporary existence of a true sugar. But the regular course of these experiments requires the presence of carbonate of lime; if this be suppressed, the mannite and glycerine usually remain unaltered, but sometimes, and only under peculiar circumstances, the formation of a true sugar may be observed.

Mannite and glycerine dissolved in water were left at the ordinary temperature in contact with all the nitrogenous tissues and substances of an animal or analogous nature which the author could procure. In many cases a true sugar was produced, capable of reducing potassio-tartrate of copper, and of undergoing alcoholic fermentation under the influence of yeast.

The conditions of this formation of sugar are sometimes capable of definition, sometimes exceptionable. It was observed with albumen, caseine,* fibrine, gelatine, and cutaneous, renal, pancreatic tissues, &c., but always accidentally, and so that the conditions of the phenomenon could not be determined.

The tissue of the testicle alone caused the conversion of glycerine and mannite into true sugar almost in a regular manner. The testicles of man or animals (the cock, dog, or horse) are cut into small pieces and placed in a solution consisting of 10 parts of water and 1 part of mannite and glycerine; the weight of the animal tissue (supposed to be dry) should represent about $\frac{1}{20}$ th of the mannite or glycerine. The operation is effected in an open bottle, under the influence of diffused light, at a temperature between 50° and 68° F. The tissue usually remains with-

* The following are some of the causes of error which must be well guarded against in these experiments:—1. Albumen and caseine contain small quantities of sugar, of which they must be freed. 2. The mannite of commerce must always be purified, as it contains 1 to 2 per cent. of sugar. This sugar is derived from manna, which contains 10 to 15 per cent. The amount of sugar pre-existing in manna does not increase by keeping. Besides sugar and mannite, manna contains nearly half its weight of little known substances, so that the employment of manna in these experiments cannot lead to any conclusion. 3. The so-called *purified* commercial glycerine contains a body capable of reducing tartrate of copper.

out putrefying; if it putrefies the experiment is a failure. The formation of moulds, and especially of *Penicillium glaucum*, is also injurious. After an interval of from a single week to three months, it is usually found that a substance has made its appearance capable of reducing potassio-tartrate of copper, and fermenting immediately with yeast. At this moment the fragments of testicle are separated by decantation, and completely freed from the mannite of glycerine by repeated washing; in this state they possess the property of converting these two substances into true sugar. The prepared tissues are operated with in the way just described, and it is even sufficient to impregnate the tissue with a solution of mannite or glycerine, to obtain a very abundant formation of sugar in a few weeks. Some experiments made with dulcine gave similar results.

The sugar thus formed is analogous to glucose in most of its properties. It could not be obtained crystallized, and is very soluble in water, aqueous alcohol and glycerine, from which it can hardly be separated. It is a very hygrometric body, very alterable during the evaporation of its solutions, capable of becoming brown under the influence of alkalies, and of reducing potassio-tartrate of copper; ammoniacal acetate of lead does not precipitate it in sensible proportions. With yeast it ferments immediately, producing alcohol and carbonic acid. It was difficult to ascertain whether it possess a rotatory power, from the readiness with which it becomes colored during the concentration of its solutions. Once the author succeeded in observing a deviation of the tint of passage equal to $5^{\circ}.5$ for a length of 200 millims.: with a liquid containing about one-twentieth of sugar; it would therefore have a left-handed rotation, and be distinct from glucose and most of the other sugars in the direction of its rotatory power.

One of the most decisive of the author's experiments to determine the origin of this substance and the influence of the testicular tissue upon its formation, is as follows:—

On the 18th of December, 1856, he weighed 2 grammes of fresh cock's testicle (representing 0.280 grm. in the dry state), 5 grms. of mannite, and 50 grms. of water; the whole was put into a bottle communicating with the atmosphere through a tube filled with carded cotton, and left in a moderately heated labor-

atory. On the 12th of April, 1857, the liquid contained 0.250 grm. of true sugar. The fragments of testicle retained their form and microscopic appearance; some almost inappreciable traces of vegetation were discovered on careful examination. When washed and dried, these fragments weighed 0.230 grm., so that they had lost 0.050 grm. This loss, however, is rather apparent than real, for the fresh testicles contain a certain portion of saline and other substances which are soluble in water, and a portion of the tissue becomes disaggregated and soluble without changing into sugar; all these products are calculated as loss, although they are found in a soluble state, and partially coagulable during the evaporation of the liquid. Taking into account these various circumstances, and the proportion of sugar formed in the preceding and other experiments, without speaking of the analogies of composition and constitution existing between the sugars and the mannite and glycerine, we shall be led to regard the sugar thus produced as resulting principally, perhaps exclusively, from the transformation of the mannite or glycerine. This conclusion is also confirmed by other experiments, in which, without perceptible diminution, the testicular tissue produced the conversion of mannite into sugar, seven times consecutively.

These facts tend to assimilate the influence of the testicular tissue with the actions of contact which have been observed in inorganic chemistry, and this is confirmed by the permanence of the microscopic structure of the tissue in the course of the experiments. These, however, are probabilities rather than a demonstration. In fact, the animal tissues do not enjoy that absolute invariability of composition which often characterizes the mineral compounds acting by contact. At the same time that the tissue acts, it becomes continuously altered; it is decomposed without putrefaction, as shown by analysis.

Thus it cannot be decided positively whether the tissue operates by the action of contact in virtue of its organic structure, or its chemical composition, or whether the very fact of its decomposition does not exert some influence. Lastly, the contact of the air, without which these experiments would not succeed, introduces a new complication, for it allows the development of microscopic animal vegetable organisms; this could never be altogether

avoided, but it appears rather injurious than otherwise. In the most successful experiments, the formation of organized beings took place in the lowest possible degree.

These details show how complex are the phenomena of fermentation, and how many unknown and obscure elements they include; nevertheless, chemists may set in action the forces which cause them, and direct them upon definite bodies, and to the accomplishment of determinate metamorphoses. It is nearly in the same way that they set in action the ordinary affinities, the intimate nature of which is scarcely better known. The employment of ferments is only distinguished therefrom by the pre-existence of a peculiar and extremely mobile form and constitution, produced without one intervention, under the influence of life.

However this may be, the preceding experiments are distinguished by their synthetic character from the fermentations hitherto known. Instead of changing sugar, mannite, or glycerine into alcohol, lactic and butyric acids, more simple compounds, and more difficult of decomposition, they lead to the conversion of mannite and glycerine, bodies which are tolerably stable, deprived of rotatory power, and approaching those which we know how to produce, into a substance endowed with less stability and a higher order of complication, in fact, into a true sugar, analogous to those formed under the vital influence in the interior of the vegetable and animal tissues.—*London Chem. Gaz. from Comptes Rendus*, May, 1857.

ON THE EMPLOYMENT OF FERROCYANIDE OF POTASSIUM FOR THE REMOVAL OF RUST SPOTS UPON WHITE LINEN.

By PROF. RUNGE.

The employment of ferrocyanide of potassium may often help us out of great difficulties in the case of rust spots upon linen. These do not always consist of common hydrated oxide of iron, but also frequently of oleate of iron, which can only be removed with difficulty, and with the assistance of heat, by oxalic acid, or the binoxalate of potash; and often not at all by sulphuric or muriatic acid, for these acids can only be applied cold and

very dilute, as otherwise the linen suffers. From the high price of oxalic acid, therefore, a cheap means is wanting, when a great quantity of such iron moulds is to be destroyed. A case of this kind once occurred to the author; in which sulphate of iron had been used instead of potash, by which 300 napkins and other table-linen all acquired a rusty yellow color, which, on being washed with soap, instead of disappearing, became darker; the sulphate of iron being decomposed by the soap, and oleate of iron precipitated upon the fibres.

Immersion even for several days in water acidulated with sulphuric and muriatic acids produced no effect, because the oleate of iron was not decomposed. It was here that the ferrocyanide of potassium did such excellent service. It was added in comparatively small quantity to the water, acidulated with sulphuric acid, and the linen was then moved about in the fluid. The linen became blue. When all the yellow had disappeared, and a clear blue had made its appearance, the linen was rinsed and treated with solution of carbonate of potash. Here the blue color again disappeared, and with it a great part of the yellow, which only remained in spots. These were then very easily got rid of by dilute sulphuric acid alone.

The explanation of this process is easy. By the formation of prussian blue, the oleic acid is separated from the oxide of iron. The carbonate of potash then brought into action combines with the oleic acid, decomposes the prussian blue, and at the same time also dissolves the greater part of the oxide of iron, so that almost all the iron-mould disappears from the stuff simultaneously with the prussian blue. Caustic lye does not act in the same way: it certainly destroys the blue, but the rusty yellow remains, because it has not the same solvent action upon oxide of iron as carbonate of potash.—*Lon. Chem. Gaz.*, July 1, 1857, from *Polyt. Centralbl.*

ACTION OF BICHLORIDE OF TIN ON STARCH.

By M. H. DE PAYR.

On wetting a microscopic slice of a horse-chestnut with a little bichloride of tin, the fecula is observed to disappear. This

observation, which was made by Rochleder, has led to the following researches being made by M. Payr.

On mixing starch with bichloride of tin in a mortar, the starch is almost immediately dissolved; a slight pitchy residue forms in the solution, which may be separated by decantation.

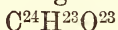
After having filtered the liquid portion, and having added anhydrous alcohol, an abundant precipitate is produced, of a brilliant white, which, washed with anhydrous alcohol, and dried *in vacuo* over sulphuric acid, is found to be composed in 100 parts of:

C	.	.	.	23.44	23.20
H	.	.	.	4.11	4.16
O	.	.	.	33.81	33.97
Sn.	.	.	.	38.67	38.50

On decomposing this matter by a current of sulphuretted-hydrogen a limpid liquid is produced, which is converted *in vacuo* into a white friable mass, which the author found to be formed of:—

C	.	.	40.90
H	.	.	5.67
O	.	.	52.43

Whence he deduces the following formula



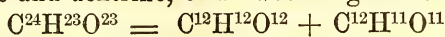
By treating starch with bichloride of tin at 100°C. (212°F.) a starch paste is obtained which afterwards liquifies; alcohol separates from it a white compound containing:—

C	.	.	.	15.56	15.44
H	.	.	.	3.05	3.30
O	.	.	.	24.31	24.18
SnO	.	.	.	57.08	57.08

The precipitate which absolute alcohol produces in this solution made with the aid of heat amounts to scarcely one-fifth part of that formed with the solution made without heat.

The compound $\text{C}^{24}\text{H}^{23}\text{O}^{23}$, obtained with the salt made without heat is not starch, for it is soluble in water, and is not turned blue by iodine. Neither is it dextrine or glucose; but, under the influence of the weak acids, it is readily converted into the latter.

From its properties and its composition, it takes its place between glucose and dextrine, or between sugar and gum, for



and, like glucose, it is composed of fecula and water.—*Chemist, June, 1857, from Journal fur Praktische Chemie.*

ON SOME CEMENTS.

By EDMUND DAVY, F. R. S., M. R. I. A., F. C. S. L., &c.

My attention has been directed to make some simple cements, which may admit of useful and ready application.

Gutta percha, as is well known, is itself an admirable cement for certain purposes, when softened by hot water or by a moderate degree of heat; and it has been used in making other cements; but I am not aware of any cement described in which it forms a part: its high commercial value is an obstacle to its application in many cases where it could be employed with advantage.

Gutta percha, though readily adapted to an almost endless variety of uses, is, however, not easily rendered fluid when alone, and hence is not quite manageable enough for certain purposes.

I have made many experiments, using different proportions of gutta percha with pitch, rosin, wax, &c., with a view to form useful cements. In the present communication I purpose to notice only one cement, which I made by melting in an iron saucepan.

Two parts by weight of common pitch, and adding to it one part by weight of gutta percha, stirring and mixing them well together until they were completely incorporated with or united with each other, formed a homogeneous fluid, which may be used in this state for many purposes, but which, on account of the facility and tenacity with which it adheres to metals, stones, glass, &c., I found convenient to pour into a large basin of cold water, in a thinner or thicker stream, or as a cake. In this state, while warm, it is quite soft, but may be soon taken up out of the water and drawn out into longer, or pressed into shorter, pieces, or cut or twisted into fragments, which may again be readily re-united by pressure.

When the cement is cold, or before, it may be removed from the water and wiped dry, when it is fit for use.

From a rough experiment I made, there appeared to be a loss of about $\frac{1}{4}$ th of the weight of the materials in making this cement, arising from volatile matter and impurities in the pitch and gutta percha.

Properties.—This cement is of a black color; when cold, it is hard. It is not brittle, but has some degree of elasticity, which is increased by a slight increase of heat. It appears to be not so tough as gutta percha, but more elastic. Its tenacity is very considerable, but inferior, if I mistake not, to gutta percha. It softens when put into water at about 100° Fahr.; and if the heat is gradually increased, it passes through intermediate states of softness, becomes viscous like bird-lime, and may be extended into threads of indefinite length: it remains in this state, even when exposed for some time in a crucible, to the heat of boiling water, at 212° Fahr. When heated to about 100° Fahr., it becomes a thin fluid. Water appears to have no other action upon it but that of softening it when warm or hot, and slowly hardening it when cold. The cement adheres strongly, if pressed on metal or other surfaces, though water be present, provided such surfaces be warm.

My first trials with this cement put it to a very severe test. I used it as a substitute for plumber's solder in repairing the lead gutters on the roof of my house, which were cracked in several places, and admitted water freely in different places, and also to staunch the leaks in an old common and forcing-pump attached for yielding a supply of water for the use of two houses, and raising it about thirty feet. For these purposes I found it quite effectual. All that was necessary in the case of the gutters was to remove with a brush all loose earthy matters from the cracked lead, slightly warm it with a hot iron, then pour the cement in a fluid state on the cracks, so as to cover them on both sides; then a hot iron was drawn along each edge of the cement so as to soften and bevil it down to the lead, as the cement has intermediate degrees of fluidity, and is thicker or thinner as it is exposed to more or less heat. In its thicker state it may, perhaps, be better adapted to repair cracks in lead or other gutters; but a crack in such gutters may be readily filled up by taking a piece

of the dry cold cement and applying a warm, but not too* hot soldering iron, so as to soften the cement on the crack, then melt it on each side and cover it with the cement. The cement will adhere with great ease to the lead, and is far more manageable than any of our common solders. A hole in a gutter could be readily stopped with the cement and a piece of lead of sufficient size to overlap the hole, say about one-half of an inch; cover the lead on both sides with a surface of the cement; press it on the hole; then cover the lead and its edges with the cement, as in putting a pane of glass.

In the case of the common and forcing-pump, it was only necessary to have every part that leaked quite dry, and slightly warm, when a good coating of the cement, in its thick state, was applied so as completely to cover the cracks or apertures. The cement used in this instance did not exceed in bulk the plumbers' solder which would have been used. The warm soldering iron was lastly applied to fill up any interstices, and produce throughout a uniform surface.

I entertain no apprehension that the warmth of our climate at any time will impair the efficacy of this cement when applied to repair lead, zinc, or iron gutters; for, though it softens at a comparatively low temperature, it still adheres most tenaciously to metals and other substances, and does not allow water to pass through it. My gutters were repaired with the cement before the very hot weather we had last summer, and not the least appearance of a leak has been since observed in the gutters.

In a similar way the cement may be readily applied to repair holes in tin cans, garden watering-pots, iron or other metal vessels which are used only for cold water. Vessels thus repaired should be left a few hours before they are used, as the cement takes some little time to set or harden.

That the presence of water does not interfere with the action of the cement was shown in cases where I put a large hammer, also a seven-pound weight, into hot water, for a few minutes. I then removed them from the water, and, without wiping them,

* When the soldering iron is too hot, and applied to the cement, it decomposes a portion of it, or raises it in a white vapor. When it is of the proper temperature, which is about 130° Fahr., it is merely softened or partially melted.

pressed the end of a small stick of the cold cement on the surface of each, when it softened and strongly adhered to the metals. I then poured a stream of cold water on each of the articles, when they could be raised from the table and carried about, being firmly supported by the cement, and considerable force was necessary to separate the articles from the cement.

This cement is applicable to many useful purposes. It adheres with great tenacity to metals, wood, stones, glass, porcelain, ivory, leather, parchment, paper, hair, feathers, silk, woolen, cotton, linen fabrics, &c. It is well adapted for glazing windows, as a cement for aquariums. As far as my experience has yet extended, this cement does not appear to affect water, and will apparently be found applicable for coating metal tanks; to secure the joints of stone tanks; to make a glue for joining wood, which will not be affected by damp; to prevent the depredations of insects on wood. The heavy oak beams and rafters in the roof of the Royal Dublin Society are attacked to a considerable extent by insects, as the weevil, &c. As this cement is soluble to a considerable extent in volatile oils, as turpentine, naphtha, &c., an application of the solution of the cement in turpentine, &c., might be beneficial, and arrest the ravages of those insects. It may be highly deserving of inquiry whether the cement may not be applied to preserve surfaces of metal and wood exposed to the atmosphere and to fresh water; also to protect anchors, chain-cables, &c., from the corroding agencies of sea water.—*Lond. Chem. July, 1857, from Journal of the Royal Dublin Society.*

ETHEREAL TINCTURE OF SESQUICHLORIDE OF IRON.

(*Tinctura Nervina Bestucheffi.*)

By A. CUSHMAN.

The excess of acid always present in the officinal tinct. ferri chlor. and its exceedingly styptic taste renders its employment in some cases objectionable.

Notwithstanding the large addition made in late years to the number of ferruginous preparations in common use, many practitioners still give preference to the sesquichloride over all others, as being the most certain in its effects, and most accep-

table to the stomach. It is, therefore, desirable that we should be able to present it in a form as free as possible from all objections.

In the German practice the *dry* sesquichloride is frequently prescribed in the form of pills, with ext. gentian and many other excellent combinations; but as this preparation is not recognised as officinal in the U. S. P., it is seldom, if ever, made by our chemists, or kept in the shops.

In a note, under the article on Tinct. Ferri Chlor., by Wood & Bache, allusion is made to the preparation to which I now wish to call the attention of the profession, under the name of *Bestucheff's Tincture*, as an article "much used in Europe," though without giving very definite instructions as to the mode of making it. It consists in a solution of the green crystals of sesquichloride of iron in a mixture of one-third sulphuric ether and two-thirds alcohol.

The tincture thus made is at first transparent, and of a light greenish color, but rapidly becomes turbid and deposits a brownish precipitate.

This precipitate is, however, entirely redissolved, and the tincture rendered perfectly white and transparent, by exposure for some hours to the direct rays of the sun, in small white glass vessels.

The proportion of ether mentioned by Wood & Bache, is one to three or four of alcohol, but that which I have adopted is taken from the Belgian Pharmacopœia, and is the same as prepared for several physicians in Philadelphia, who have used it largely. It is certain that this tincture is a much more elegant one than that of the U. S. Pharmacopœia, while it has the advantage of being perfectly free from acid, and possessing a sweetish, slightly ferruginous taste, instead of the excessive astringency of the latter.

The formula for its preparation is as follows:

Pure iron filings,	.	.	two ounces.
Muriatic acid,	.	.	eight fluid ounces.
Nitric acid,	.	.	four fluid drachms.
Distilled water,	.	.	four ounces.

The muriatic acid and water being mixed together; the iron filings are dissolved therein; the nitric acid then being added,

the whole is evaporated till a pellicle is formed, when it is set aside to crystallize. The crystals, as at first procured, are very much discolored, and require to be washed in alcohol, and redissolved and crystallized, to free them from adhering sesquioxide. This done, they are of a light green color, sweetish ferruginous taste and quite deliquescent, so that if not used immediately for solution, they should be transferred to hermetically sealed bottles. For the preparation of Bestucheff's Tincture I use the following proportions:

Crystals of sesquichlor. iron,	.	.	2 ounces.
Spirit of wine, rect.	.	.	16 "
Sulphuric ether,	.	.	8 "

Dissolve, filter, and expose in white glass vials for forty-eight hours to the direct rays of the sun, or until it becomes colorless. It will be seen that six drachms of the above tincture contain thirty grains of the dry sesquichloride, which is nearly double the strength of the officinal tincture.

It now remains to point out the only objection which may be urged against it, namely, that in the absence of strong light it gradually deposits a brownish precipitate of sesquioxide, which somewhat detracts from the elegance of its appearance. To prevent this, I have undertaken some experiments, which, if successful, will be communicated.

Meanwhile, I will add, that the exposure of the vial containing it to the full rays of the sun for a few hours, will always cause a resolution of the precipitate, and restore the transparency of the tincture.—*American Medical Gazette*, August, 1857.

ROTTLEIRA TINCTORIA AS A REMEDY FOR TAPE WORM.

BY DR. THOS. ANDERSON, ASS. SURG.

The *Rottlera tinctoria* is a species of euphorbiaceous plant found in the hilly parts of India, as along the base of the Himalayas from Assam to near Peshawur, in Central India, at the Northern Cercars, in Mysore, and at Parell Hill, near Bombay. In its habit it is almost arborescent, growing to twenty or thirty feet high. The substance called kamila, obtained by brushing the powder off the capsules of this plant, has long been known in India as a dye, and it is also occasionally used by the natives

as a vermifuge; this latter property is supposed by Dr. Royle to depend upon the stellate hairs found in the powder. Dr. Anderson mentions that his attention was first called to the medicinal properties of this substance by Dr. Gordon, of the 10th Regiment, who had met with great success in employing it as a remedy for tape worm. Dr. Anderson afterwards employed it himself for the expulsion of the same parasite in the case of several men of his own regiment. The powder is of a dark brick-red color, with a peculiar heavy odor, increased on its being rubbed between the fingers. Its physiological action is very simple: on an adult the powder in a dose of ʒij or ʒss , besides purging, very often causes nausea and vomiting, and in some cases griping; its action on the bowels, however, is very variable, producing from four to ten or fifteen stools even when a dose of ʒij has been administered. A strong ethereal or alcoholic tincture, besides acting more mildly, is followed by more uniform effects. Dr. Anderson found that an amount of the tincture sufficient to produce the full anthelmintic effect of the drug was never followed by more than six stools, and always acted without griping. After ʒij of the powder have been administered, the worm is usually expelled in the third or fourth stool. It is generally passed entire, and almost always dead, and in about fifteen cases examined by Dr. Anderson he was unable to detect the head. The vermifuge properties of *rottlera tinctoria* have been attested in a large number of cases. Dr. M'Kinnon has mentioned sixteen successful cases in a paper published by him, and he has since administered the powder to nearly fifty patients, out of whom there were only two cases in which no worm was expelled. Dr. Gordon has tried the remedy in thirty cases of tapeworm with uniform success. The dose of the powder of the kamila which seems to act most satisfactorily is ʒiiss to ʒij in an adult; and ʒss of the alcoholic tincture is the dose which is followed by the most successful effects.—*American Journal of Med. Sciences, from Indian Annals of Med. Sc., Oct., 1856.*

TRANSFORMATION OF AMYGDALINE INTO HYDROCYANIC ACID WITHIN THE BODY.

Professor Kölliker, and Dr. Müller, of Würzburg, have arrived at the following results from a series of experiments: 1. Amygdaline and emulsine introduced separately into the circulatory system by different channels, form prussic acid in the blood. 2. When the quantity of these substances is sufficiently large death soon occurs; it takes place more slowly with weaker doses. When amygdaline is first injected into the blood, and emulsine an hour afterwards, death speedily occurs. 3. When emulsine is first injected, and amygdaline forty-five minutes afterwards, death is retarded. Is the emulsine changed in the blood, or rapidly excreted? 4. Poisoning is not produced by injecting amygdaline into the blood, and emulsine into the alimentary canal. The emulsine, therefore, does not pass from the blood into the digestive canal, at least not without some change; on the other hand, it is not found in the intestines on post-mortem examination. 5. When emulsine is injected into the blood, and amygdaline into the intestines, poisoning occurs, though slowly. Death has been produced by introducing amygdaline into the digestive canal of rabbits, without any emulsine. The intestines of these animals, contain a ferment, capable of converting amygdaline into prussic acid. 6. Amygdaline injected into the veins, or into the intestines, passes off in large quantities, sometimes rapidly by the urine; some experimenters, as Wöhler and Frerichs, have not found amygdaline with certainty in this excretion; others, as Ranke, suppose it to be converted into formic acid.—*British and Foreign Med.-Chir. Rev., from Allgem. Medicin. Central. Zeitung.*

PRELIMINARY NOTE ON THE TANNIN OF GALLS.

By F. ROCHLEDER.

The author long since stated, that the treatment of certain organic substances with boiling alkaline solutions in an atmosphere of hydrogen furnished a good means of breaking them up. This process has been applied by Kawalier, in the author's

laboratory, to various substances. Several bodies which furnish crystallized sugar when treated with dilute acids with the aid of heat, also furnished this sugar when treated in this way with alkalies; thus, for example, a yellow crystallized substance from twigs of *Thuja occidentalis* may be decomposed by alkalies, as also by acids, in hydrogen gas, into well-crystallized grape-sugar, and a yellow crystalline body, similar to quercetine, which acquires a beautiful bluish-green color with ammonia. The author has also induced Kawalier to submit the tannin of galls to this treatment. In this way is obtained gallic acid, which may easily be procured pure by this process, and an amorphous yellowish body, of a somewhat bitter and acid taste, similar to gum-arabic, which on analysis gave numbers corresponding with the formula $C^{12}H^{11}O^{11}$. From about 150 grms. of tannin, not 1 milligrm. of sugar was formed. The fluid freed from gallic acid reduced no trace of protoxide of copper from Fehling's fluid. Further experiments, which Kawalier has commenced with larger quantities of tannin, will serve to determine the atomic weight of the amorphous body.—*Chem. Gaz. June 15, 1857, from Sitzungsber. der Akad. der Wiss. zu Wien.*

Varieties.

The Gums and Resins of Commerce. By P. L. SIMMONDS.

(Concluded from page 379.)

A resinous gum called Alkor Lek (whence the word lac), flows from the *Pistacia Terebinthus*, Linn., in Algeria, which, mixed with other ingredients, is given as a purgative for fowls. It is supposed that this tree would yield good terebinthine. The gum flows so abundantly, even without incision, that it is often dangerous to sleep under the trees.

Under the commercial name of DRAGON'S BLOOD, the produce of several species of *Dracæna* is imported to the extent of about 100 packages of 1 to 2 cwts. each. In commerce the resin occurs in powder, grains, masses, drops of the size of an olive, and in sticks enveloped in the leaf of the talipot palm. Its chief use is for coloring artificial tortoise-shell, and in paints, varnishes, sealing-wax, &c. It stains marble, especially if the stone be heated. The resin is used occasionally in medicine as a tonic and astringent, and also in opiates and dentifrices. Occasionally a brick red powder, known in the East as wurrus, has been passed off here for dra-

gon's blood. This is collected from the seed-vessels of a euphorbiaceous tree, the *Rottlera tinctoria* of Roxburgh, occurring in Arabia, Eastern Africa, and various parts of India. The Chinese esteem dragon's blood highly. It is obtained in Socotra, from the *Dracæna draco*, which is usually met with on the hills at the elevation of 800 to 2000 feet above the level of the sea. There are two kinds there, and the best is of a dark crimson color. Jacquin states that the lump dragon's blood is the produce of *Pterocarpus draco*, but this is very questionable. A common kind in the eastern bazaars is the produce of the red astringent fleshy fruit of the *Calamus draco*, or by incisions in the stem, or natural exudations from various parts of the plant. An inferior kind is obtained by boiling the fruits. In the Madras bazaars, dragon's blood ranges in price from £3 to £11 the maund of 82 lbs., according to quality.

Dragon's blood was the cinnabar of the ancient Greeks. In the time of Dioscorides the opinion prevailed that it was the indurated blood of a dragon; and other old authors tell us that the tree received its name from having the figure of a dragon upon the fruit.

A red juice flows from the wild nutmeg on incisions being made into the bark. This hardens into laminated resinous pieces, red and transparent, and forms a variety of the substance known in commerce under the name of dragon's blood. Professor Lindley states, on the authority of Endlicher, that a species of *Myristica*, of the Phillippines, yields a crimson juice, which is collected from incisions in the trunk, and used as a substitute for dragon's blood, under the name of Durgan.

The *Icica* tribe, lofty trees of South America, produce resinous exudations of value in the districts where the trees occur. Of these I have specimens here in the Carana and Tacamahaca resins; and the resins of Perama, another dark resin from Central America. The *Icica Icicariba* or *Amyris elemifera*, produces elemi, which resembles olibanum closely in its properties and uses.

ASPHALTE is manufactured at home by one or two companies to the extent of two or three thousand tons per annum. Small imports are received from America and the Continent for the use of varnish-makers, but as it does not appear in the trade returns, it is probably included with pitch, of which we receive about 300 to 350 tons yearly. But little of the genuine Egyptian asphalte is now to be met with. There is one prolific source of asphaltum from which little commercial benefit has yet been derived, at least to the extent to which it is susceptible, and that is the Pitch Lake of Trinidad, covering a surface of about a mile in length by an eighth in width. Though the surface is generally too firm to receive a foot-print—just hard enough to cut readily with an axe—there are places where the pitch oozes out in nearly a liquid form. But the pitch is not confined to this locality. There are masses of it extending wider inland, and in several points it reaches to the sea-beach, whence it is shipped in large quantities to America, and some of the West India Islands, to use in

building and flagging streets. Near the Lake some of the negroes occupy themselves in boiling down the pitch, some of which is shipped in a pure state, and some, with the addition of lime, exported as mastic. Many hundreds of tons have been thus taken from the lake, to the depth of about a foot below the surface. The hole is always filled again within two days after the cutting, by the upheaving of the mass. It appears as though billions of tons of pitch had boiled up from the bowels of the earth, from the effects of an immense subterraneous fire, which had been extinguished, and left the asphaltum to cool in enormous bubbles.

Various attempts have been made to apply the inexhaustible store of bitumen afforded by this lake to some useful purpose. It is the best substitute for macadamization yet discovered. Mixed with sand and pebbles it is much used for pavements and the ground floors of houses at the town of Port-au-Spain, a purpose for which it is admirably adapted. The late Sir Ralph Woodford, when governor of the island, tried to obtain carburetted hydrogen gas from it to light a beacon on the tower of Trinity Church. It burnt well, but created such an intolerable stench, that the experiment was obliged to be abandoned. The person entrusted with the trial, however, knew nothing of chemistry. It has been employed to advantage as fuel by the American steamers plying on the Orinoco. It is thrown in the furnace among the wood, fusing too readily to be used alone.

With ten per cent. of resin oil it forms an excellent pitch for vessels. It was used for this purpose so far back as 1593, by Sir Walter Raleigh, who tells us that this substance was then in general use by the various tribes of Indians in the river Orinoco for caulking their canoes. It has been recently coming into use in the manufacture of petroleum. It might, I should suppose, form a base for some of the compressed artificial fuels.

The Earl of Dundonald has long had great faith in its ultimate commercial utility. Twenty or thirty years ago he shipped two cargoes of it to England, but it was found then to require too much oil in order to render it useful. Lately his lordship has purchased a large tract of the pitch lands, including twenty-six acres of the lake, and has instituted various experiments with the view of substituting the bitumen for India rubber and gutta-percha in the manufacture of water-proof fabrics, covering of telegraph wires, &c. Judging from the specimens of those shown by his agent at Port-of-Spain (Mr. C. F. Stollmeyer), these efforts bid fair to be quite successful. It seems only necessary that the same amount of intelligent enterprise should be directed to the subject in order to render this wonderful reservoir of bitumen a source of great individual profit and of essential service to mankind. If it could be brought into extensive commercial use for pavements and for the ordinary purposes of pitch and tar, Trinidad could easily furnish supplies for the whole world. Persons desirous of information connected with this lake will find good accounts in

the *United Service Journal* for January, 1839, by Dr. Thomas Anderson ; in Martin's "West Indies," vol. i. p. 191 ; by Mr. Alex. Anderson, quoted in M'Callum's "Travels in Trinidad," originally given, I believe, in "Transactions of the Royal Society," vol. lxxix. p. 65, and in *Fisher's Colonial Magazine*, vol. iii. p. 43 and 426. The most recent and best account will be met with in a paper by Mr. N. S. Manross, in *Silliman's American Journal of Science and Art*, vol. xx. p. 153 (No. for September, 1855).

The ELASTIC GUMS are among the most important and generally useful that come into commerce, and although at present confined to two varieties, there is no reason why additions should not be made to the list, and investigation promoted to elicit the comparative value of others. The rapid progress of the submarine telegraph, setting aside other important commercial uses of gutta percha, loudly calls for fresh supplies. If no other purpose had been subserved by this Indian gum than that of encasing the telegraph wires, mankind would have reason to be eminently grateful to the discoverers, and to the Society of Arts for the reward and publicity given to its merits.

We can all recollect when the only uses to which india-rubber was applied, was to rub out pencil marks, and make trap-balls for boys, but now it is made into shoes and hats, caps and cloaks, foot-balls and purses, ribbons and cushions, boats, beds, tents, and bags ; into pontoons for pushing armies across rivers, and into camels for lifting ships over shoals. It is also applied to a variety of other uses and purposes, the mere enumeration of which would be tedious. New applications of it are indeed continually being made.

Boundless forests of the Serang tree are found upon the banks of the Amazon, and the exportation of this elastic gum from the mouth of that river is daily becoming a business of more and more value, extent and importance.

Already within the past five years we have doubled our imports from Brazil (besides the large quantities which the United States draw from thence), and we have also increased our supplies of this elastic gum from the East, the imports from Singapore having risen from 559 cwt. in 1849, to 3030 cwt. in 1853.

Of substances which may be used as substitutes to some extent for caoutchouc or gutta percha, the inspissated juices of the jack fruits and trees, those from the wild and cultivated bread fruit trees, and the lola tree may be mentioned.

Various species of Indian fig-trees, as *Ficus radula*, *elliptica*, &c., also furnish portions of the elastic gum of commerce. *Vakea gummifera* likewise supplies caoutchouc. The *Urceola elastica* (which produces the Gintawan of the Malays,) abounds on the islands of the Indian Archipelago ; in Java it is called "bendud."

The concrete milky juice of the *Cryptostigeia grandiflora*—a handsome climber, common in the Madras Peninsula—has long been known to contain caoutchouc, but it has not yet been collected for the purposes of commerce, and it is doubtful if a sufficient quantity could be obtained to render it an article of trade. The milk from the cow tree appears to contain caoutchouc. It is supposed to be obtained from *Tabernaemontana utilis* of Arnot, or a species of *Brosimum*. On the river Demarara the Indians climb the rubber tree, tap the trunk, and as the gum exudes, rub it on their bodies till it assumes a sufficient consistency to be formed into balls.

Recent inquiry has shown that caoutchouc is furnished of good quality, by a large number of milky-juiced plants belonging to different families (*Sapotaceæ*, *Apocynaceæ* and *Euphorbiaceæ*). In the East, Assam now furnishes large quantities of india-rubber from *Ficus elastica*. Complaints are, however, made of the want of care in the preparation of the article from Assam.

If the previous purifying of the gum be properly attended to—and in this process the whole art of manufacturing the perfectly elastic gum of commerce seems to exist—the gum should not, by any exposure to the atmosphere, be subject to the least degree of clamminess or viscosity; and if this important point be not fully attained, the article is of no use in the manufacture of those fine elastic threads which constitute its chief value in the European markets. The art of obtaining this complete freedom from clamminess, and consequent perfect elasticity, does not appear by any means to have been reduced to a certainty; and, consequently, a far better acquaintance with the article than is yet possessed by the Assam manufacturers seems requisite before it can be obtained with constantly the same results.

A substance resembling caoutchouc was said to have been obtained in Sierra Leone from a plant of the Euphorbia tribe, so long ago as Tuckey's voyage up the Congo, in 1816. Some large forest trees, belonging to the Sapotaceæ family, which abound at the foot of the Ghauts, N. E. of Trevan-drum, furnish a valuable elastic gum, called by the Malays pauchouthee, which bears a strong resemblance to gutta percha both in external appearance and mechanical properties, and the real *Isonandra gutta*, would appear to be common in the forests of the Neilgherries.

GUTTA PERCHA has been discovered in the British province of Mergui, and though not precisely identical with the gutta percha of commerce, it possesses all the valuable properties of that substance, including plasticity in hot water, and the power of insulating electric currents.

The tree from which the true gutta taban is produced (erroneously misnamed in Europe gutta percha, a gum yielded by a different tree), is one of the most common in the jungles of Johore and the Malay Peninsula. It is not found in the alluvial districts, but in undulating or hilly ground. There is a great uniformity in the size of the full grown tabans, which rise with perfectly straight trunks from 60 to 80 feet in height, and from 2 to 3

feet in diameter, the branches being few and small. The natives, after felling the tree, make an incision round it, from which the milk flows. This is repeated at distances of 6 to 18 inches along the whole trunk. It appears that the taban, or milky juice, will not flow freely like dammer and caoutchouc, but rapidly concretes. Its appearance in this state before being boiled is very different from that of the article as imported into Singapore, and then shipped to Europe. It has a dry, ragged look, resembling shreds of bark, and instead of being dense and tough, is light, and possesses so little cohesion that it is easily torn in pieces.

Various statements are made as to the produce of each tree, which is somewhat surprising, considering the uniform size of the trees. The extremes mentioned are two catties and fifty catties. Dr. Oxley takes the average yield at ten catties, but probably five would be nearer the mark, hence it would take twenty trees to produce one picul of gutta, or 133 lbs., and as the exports of gutta percha, from the commencement of the trade up to the close of 1853, have amounted to 3107 tons, it follows that upwards of one million trees must have been destroyed to obtain that quantity in nine years. The natives, however, do not appear to be under any apprehension that the trees will be extirpated, and smile at the probability when suggested, for it is only trees arrived at their full growth, or at least at a very considerable age, that repay the labor of felling them and extracting the gutta, and those of all inferior ages which are therefore left untouched, will, it is supposed, keep up the race.

The collection of the gutta has widely extended, embracing now the Johore Archipelago, Sumatra, Borneo, and Java. Unfortunately, the quality has deteriorated by the admixture of gutta percha, jelotong, gegrek, litchin, and other inferior gums, the products of different trees, which are often used to adulterate the taban.

The Gitah Laboe is the produce of *Ficus cerifera*, Blume, which promises to be of great importance in an industrial point of view. The natives of Sumatra form torches of it, which burn with a clear flame, but make a great deal of smoke. A hydro-carbon, closely resembling Cullemundoo gum, from Jaulhna, was shown this year at Madras obtained from *Euphorbia tirucalli*. It differs considerably from caoutchouc or gutta percha in its physical qualities.

The milky juice of the Muddar plant of India (the *Asclepias* or *Calotropus gigantea*), gradually dries and becomes tough and hard, like gutta percha. It thrives on the poorest soils, and also furnishes an excellent fibre, useful in the place of hemp and flax.

The juice of the sappodilla plum tree, the *Achras sapota* of the West Indies and South America, is slightly adhesive to the touch, but it differs from gutta percha by becoming adhesive and extremely glutinous after being immersed in boiling water, while gutta percha immediately on exposure to a cooler temperature regains its original toughness and flexibility.

An elastic gum resin from an Australian *Ficus* was shown at Paris in the New South Wales collection, in small tears, of a dingy appearance, which might prove useful. A large portion dissolves in warm linseed oil, but spirits of wine does not act readily on it. By mastication it becomes tenacious and bleaches thoroughly.

The Royal Patriotic Society of Havana endeavored to introduce the cultivation of the *Ficus elastica*, and other elastic gum-yielding plants, into the Island of Cuba, but their efforts seem not to have succeeded.

The Cullemundoo gum attracted particular attention in 1851, and the exhibitor was rewarded with a prize medal, from the impression of its adaptability to various purposes in the arts. It is obtained from the *Euphorbia antiquorum* of Roxburgh, and this year, at the local exhibition at Madras, the products of two other species, *E. tirucalli* and *neurifolia*, received honorable notice, although the substances differed in their physical qualities from the true elastic gums of commerce.

An examination of the inspissated gum elastic juices of a number of trees from different localities, and prepared in a different manner, renders it probable that there are a variety of similar vegetable products yet untried, which may be advantageously introduced into commerce. They certainly deserve to be brought specially under the notice of our manufacturers, though as yet many of them are almost unknown to the very natives of the places in which they are prepared. Gutta trap, the inspissated sap of an *Artocarpus*, obtained on the Island of Singapore, and used for making birdlime, was favorably mentioned by the Jurors in 1851.—*Journ. Frank. Inst. from Jour. Soc. Arts, London, 1855.*

NOTICE

To the Pharmacutists and Druggists of the United States.

The Sixth Annual Meeting of the American Pharmaceutical Association will be held in the city of Philadelphia, on Tuesday, 8th of September ensuing, at 3 o'clock, P. M., in the Hall of the College of Pharmacy, Zane street above 7th.

The object of the Association, and the conditions of membership, are explained in the following extracts from the Constitution.

ARTICLE I.

1st. To improve and regulate the drug market by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulteration.

2d. To establish the relations between druggists, pharmacutists, physicians and the people at large, upon just principles, which shall promote the public welfare and tend to mutual strength and advantage.

3d. To improve the science and the art of Pharmacy by diffusing scien-

tific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4th. To regulate the system of apprenticeship and employment so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5th. To suppress empiricism, and as much as possible to restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

ARTICLE II.—*Of the Members.*

SECTION 1. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, who, after duly considering the objects of the Association, and the obligations of its Constitution, is willing to subscribe to them, is eligible to membership.

SECTION 2. The mode of admission to membership shall be as follows: Any person eligible to membership may apply to any member of the Executive Committee, who shall report his application to the said committee. If after investigating his claims they shall approve his election, they shall, at the earliest time practicable, report his name to the Association, and he may be elected by two-thirds of the members present on ballot. Should an application occur in the recess, the members of the committee may give their approval in writing, which, if unanimous, and endorsed by the President, shall constitute him a member, and the fact be reported to the Association at the next succeeding meeting.

SECTION 4. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution, and is liable to lose his right of membership by neglecting to pay said contribution for three successive years. Members shall be entitled, on the payment of three dollars, to receive a certificate of membership signed by the President, Vice-Presidents and Secretary, covenanting to return the same to the proper officer on relinquishing their connection with the Association.

SECTION 5. Every local Pharmaceutical Association shall be entitled to five delegates in the annual meetings, who, if present, become members of the Association, on signing the Constitution, without being ballotted for.

GEO. W. ANDREWS, President.

Baltimore, May, 1857.

Minutes of the Maryland College of Pharmacy.

Baltimore, April 2d, 1857.

The College met, and in the absence of the President, the first Vice President took the chair.

In the absence of the Secretary, Mr. J. F. Moore was appointed Secretary pro tem, and upon calling the roll twelve members answered to their names.

The Committee on plate of certificate for Contributing Members, reported the certificate printed and in the hands of the Treasurer for distribution.

Some remarks were made by Prof. Grahame on Tincture of Veratrum Viride, urging the propriety of the College adopting uniform formulæ.

After some discussion, on motion of Mr. Moore a Committee of three was appointed to investigate the subject and report a formula at the next meeting. The Chairman appointed Messrs. Moore, Phillips and Rogers, said Committee.

No other business being brought before the College, on motion adjourned.

MINUTES OF THE BOARD OF TRUSTEES.

Baltimore, April 2d, 1857.

The Board met after the adjournment of the College, six members present. Mr. Baxley made some remarks on the impropriety of members of the College advertising their membership on Circulars, &c., and on motion of Mr. Phillips a Committee was appointed to see what action, if any, the College should take in the matter, and report to the next meeting of the Board. Mr. Phillips was appointed said Committee. Mr. Grahame made some remarks on the propriety of making an arrangement for clerks in wholesale stores to attend the lectures of the College, and granting them some diploma or certificate; after considerable discussion it was referred to a committee of three, who were instructed to report to the next meeting. Messrs. Moore, Baxley and Sharp were appointed said Committee. On motion adjourned.

MINUTES OF THE COLLEGE.

Baltimore, March 7th, 1857.

The College met, and in the absence of the President, the first Vice President took the chair.

The Committee to whom was referred the formula of Mr. W. S. Thompson for Powdered Blue Mass, reported as follows: "That after trial with several modifications of the process given by him, we found the following to produce the most satisfactory result. Take of well prepared blue mass any convenient quantity, mix it with eight or ten times its weight of water of a

temperature not exceeding 150° Fah., put the mixture aside for subsidence, pour off the supernatant liquid and add to the residue about the same bulk of cold water as at first; let it stand as before, till complete subsidence occurs. Repeat the washings three times. Transfer the washed mass to an evaporating dish, and by means of a water bath dry it thoroughly. With the dried mass thus obtained mix a sufficient quantity of finely powdered starch and sugar of milk in equal proportions to make up the original weight of the mass, and triturate until the powder assumes a homogeneous appearance. It will be observed that the only variation from the formula by W. S. Thompson, consists in the substitution of sugar of milk for sugar, and in advising less frequent washing, we having found that too frequent washing caused the separation of the mercury in globules."

Signed

ISRAEL J. GRAHAME,
A. P. SHARPE.

Mr. Phillips, from the committee on Essays, etc., read a paper embodying rules and regulations, for the guidance of said Committees in the discharge of their duties, which was concurred in.

Mr. Phillips gave notice of an amendment to the By-Laws which he proposes to offer at the next meeting; to be appended to Sec. 5th of Article 6th, as follows; "The publication of the certificates of membership as a business advertisement is deemed inconsistent with the spirit of the Code of Ethics." The committee appointed at the last meeting to report a formula for Tincture of Veratrum Viride recommend the following formula:

Take of Root of Veratrum Viride	.	.	.	8 oz.
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Alcohol 80 per ct.	.	.	.	Oj.
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To be prepared either by displacement or maceration. After some discussion the formula was adopted. On motion adjourned.

MINUTES OF THE COLLEGE.

Baltimore, June 4th, 1857.

The College met, and in the absence of the President and both Vice Presidents, Mr. Roberts was on motion requested to take the chair.

The amendment to the By-Laws, offered by Mr. Phillips at the meeting in May, was on motion ordered to lie over until the July meeting. No other business having been brought before the meeting, the College adjourned.

MINUTES OF THE BOARD OF TRUSTEES.

Baltimore, June 22nd, 1857.

The Board met, and was called to order by the First Vice President. Present, Messrs. Grahame, Baxley, Sharpe, Roberts, Moore and Thompson.

On motion the Board went into an election for Professors for the ensuing year. Whereupon, Messrs. Steiner, Frick and Grahame, were nominated and unanimously re-elected. On motion adjourned.

MINUTES OF THE COLLEGE.

Baltimore, July 2nd, 1857.

The College met, and in the absence of the President, the Vice President took the chair. Upon calling the roll, fourteen members answered to their names. This being the regular meeting for election of President, Secretary, Treasurer, and one of the Board of Examiners, Geo. W. Andrews was elected President, J. Faris Moore, Secretary, J. B. Baxley, Treasurer, and Charles Caspari, one of the Board of Examiners.

A communication was received from Dr. Monmonier, on the part of the Medical and Chirurgical Faculty of Maryland, proposing to rent a room owned by them, No. 27 North Calvert Street, for the use of the College. After some discussion, on motion of Mr. Smith, the whole subject was left with the Board of Trustees, to act at their discretion. The amendment of Mr. Phillips, to be appended to Section 5, of Article 6th, of the By-Laws, was brought up, and after considerable discussion was on motion laid on the table. On motion of Mr. Roberts, the resolution to lay on the table was reconsidered, when Mr. W. S. Thompson offered the following substitute.

Resolved, That we discountenance the publication of the certificate of membership, as an advertisement in connection with Patent Medicines, or Proprietary articles. Which was adopted.

The Treasurer's account for the past six months, was read as follows:—

Balance on hand as per January report,	\$3.26
Amount received from January 1st to June 31st,	302.00
	<hr/>
Total,	\$305.26
Disbursements for the same period, as per vouchers,	249.21
	<hr/>
Balance on hand July 1st, 1857,	\$56.05

On motion a Committee of three was appointed by the Chairman, to examine the account.

N. H. Jennings, Jas. W. Bowers and Edwin Eareckson, were appointed said Committee. On motion adjourned.

MINUTES OF THE BOARD OF TRUSTEES.

Baltimore, July 6th, 1857.

The Board met, and was called to order by the Vice President. Present, Messrs. Grahame, Phillips, Baxley, Sharp, Caspari and Moore.

J. Faris Moore offered his resignation as one of the Board of Examiners. which was accepted. On motion, Joseph Roberts was elected to fill his place. On motion the Board adjourned.

MINUTES OF THE BOARD OF TRUSTEES.

Baltimore, July 27th, 1857.

The Board met, and was called to order by the Vice President. Present, Messrs. Grahame, Baxley, Roberts, Caspari and Moore.

The Committee to whom was referred the subject of Clerks in wholesale stores attending the Lectures of the College, reported, and were continued.

Prof. Grahame read the contemplated circular for the Lectures of the next session for the approval of the Board. On motion the Board approved of the circular, and ordered 400 copies to be printed.

On motion the Board adjourned.

MINUTES OF THE COLLEGE.

Baltimore, August 6th, 1857.

The College met, the 1st Vice President in the Chair.

Mr. Sharp offered a formula for Anodyne Plaster, which, on motion, was ordered to be placed on the Minutes, as follows :

Rx.	Lead Plaster,	-	-	-	-	-	3x.
	Gum Elemi						
	White Wax aa:	-	-	-	-	-	3j.
	Rosin,	-	-	-	-	-	3ss.
	Dragon's Blood, (in powder,)				-	-	3ij.
Melt together and add							
	Pulv. Myrrh,	-	-	-	-	-	3vj.
	Pulv. Opii,	-	-	-	-	-	3ij.
And when nearly cold,							
	Pulv. Camphor,	-	-	-	-	-	3iss.

Mr. W. S. Thompson made some remarks on the mode of preparing Syrup Rhei Aromat., recommending the following process: "Having reduced the ingredients to a coarse powder separately, make a tincture of the aromatics with a small portion of the diluted alcohol. Mix the dregs left after the displacement of the aromatic portion with the rhubarb and a sufficient quantity of washed sand, and displace with the remainder of the diluted alcohol. Proceed in the usual manner for making syrup, and when the process is nearly completed add the Aromatic Tincture, previously reduced by evaporation over a water bath to one half."

The Committee to whom was referred the Treasurer's account, made their report which was accepted.

On motion, the College went into an election for delegates to represent the College in the American Pharmaceutical Association, which meets in Philadelphia, in Sept. next. Upon counting the ballots, the following gentlemen were found to be duly elected: J. B. Baxley, J. F. Moore, I. J. Grahame, James W. Bowers and Joseph Roberts.

On motion, a Committee of two, of the delegates, was appointed to collect the annual contribution of the members of the National Association, who reside in this city, for the coming year. The Chairman appointed J. F. Moore and Joseph Roberts said Committee.

After some very interesting conversation on subjects connected with Pharmacy the College adjourned.

J. FARIS MOORE, Sec.

Editorial Department.

AMERICAN PHARMACEUTICAL ASSOCIATION.—In a few days this body will convene at the Hall of the Philadelphia College of Pharmacy, Zane st. above 7th, (Tuesday, Sept. 8th, at 3 o'clock P. M.,) where preparations are being made for its accommodation. Having already, on several occasions, urged the propriety of our distant brethren straining a point to get to the meeting, we now turn to those nearer home, and at home. Owing to the fact that the Association has not met here since its original organization, in 1852, there are fewer members from this city than from almost any other where it has been called together. It is therefore expected that among the reputable pharmacutists of Philadelphia and its vicinage, many will seek to ally themselves to the Association, and thus lend their aid to a movement which eventually is calculated to effect great and useful reforms in the practice of Pharmacy, and in the trade in drugs. Philadelphia has always taken a prominent part in such movements, and we wish to see her pharmacutists enter heartily into the cause advocated and represented by the body about to convene, viz: "The advancement of Pharmaceutical knowledge, and the elevation of the professional character of Apothecaries and Druggists throughout the United States." As the reading of scientific papers and the discussions of subjects relating to the business of pharmacutists is an important part of the business of the meeting, there will doubtless be much to interest those in attendance.

PHILADELPHIA COLLEGE OF PHARMACY—THE SCHOOL OF PHARMACY.—Since the last session, the College, in view of the increased numbers in attendance, have fitted up a new and larger room for the accommodation of the School of Pharmacy, in place of the lower room formerly occupied, which will now be used solely for the library, museum and meetings of the College and Board of Trustees. The new lecture room embraces the entire third story, and for convenience of arrangement, thorough ventilation and light, is the best room in the building. The second story lecture room has also been improved, and a small lateral room attached as a depository for apparatus, etc., pertaining to the chemical and pharmaceutical lectures. The Hall in the first story has been completely renovated, the staging formerly occupied by benches removed and the floor levelled, a small Committee room attached, and the vestibule increased in size, with *lateral* doors. The building has also been thoroughly painted, outside and in, and presents a much improved appearance.

The school of Pharmacy, as will be seen by reference to the announcement in our advertising columns, will be opened by a general introductory on

Friday evening, Oct. 2d, and continued on Monday, Wednesday and Friday evenings, until the 1st of March—two lectures on each evening. The lectures consist of three courses—on Chemistry, Materia Medica and Practical Pharmacy,—and are thoroughly illustrated with apparatus, specimens and diagrams, and no trouble is spared by the professors in rendering the subject as clear and lucid as possible. The conditions of graduation are appended to the advertisement.

DR. EDWARD R. SQUIBB. LOUISVILLE CHEMICAL WORKS.—Our readers have become familiar with the name of Dr. Squibb as the author of various papers which have appeared in this journal during several years past; during which period (and before) he has conducted the manufacturing department of the U. S. Naval Laboratory, at Brooklyn, in a highly satisfactory manner, and supplied to the navy the pharmaceutical preparations of the Pharmacopœia in a uniformly good condition. Notwithstanding the importance of his service, the emoluments of his office are limited to the small salary of Passed Assistant Surgeon. At his own request Dr. Squibb has been detached from the Naval Laboratory in order to accept the position, *temporarily at least*, of manufacturing co-partner in the firm of Thomas E. Jenkins & Co., of Louisville, Kentucky, which firm is about to establish, in connection with their drug business, a large manufactory of chemical and pharmaceutical preparations under the title of "Louisville Chemical Works." Prof. Smith, of the University of Louisville, is also a partner in the firm. Dr. Squibb will have charge of the manufacturing department of the works, and Mr. Jenkins the commercial department, leaving the financial department for Prof. Smith.

Located near the centre of the great valley of the Mississippi, the firm intend to seek their market chiefly west of the mountains, and as the pioneer establishment of this kind, out there, propose to adhere strictly to the Pharmacopœia in the purity of their preparations, on which condition only Dr. Squibb entered the firm, as he is well known as the uncompromising enemy of adulterated drugs and chemicals, come they from what quarter they may. We trust, with intentions so fair, they may meet success, and join our friends Powers & Weightman, Rosengarten & Sons and other houses, in developing the resources of this great country, and stopping the influx of foreign chemicals.

RESIN OF LIQUIDAMBER STYRACIFLUA.—Mr. Daniel Hanbury, in a letter to the editor, dated London, June 2, 1857, says in reference to this resin as follows:

"I thank you for the sample of liquidamber resin. The acid which it contains you will find to be *cinnamic*; it is easily extracted by boiling the resin with lime and water, filtering the hot liquor and allowing the cinna-

mate of lime to crystallize out. Upon decomposing the cinnamate with hydrochloric acid, the cinnamic acid separates in platy crystals; the process, in fact, is precisely that sometimes adopted in preparing benzoic acid.

From this acid, cinnamic is distinguished by heating it in a test tube or small flask, with solution of chloride of lime, when it evolves the odor of essential oil of bitter almonds (Hydruret of Benzule), while benzoic yields nothing of the sort. I have used this test repeatedly—in some cases when I have not had more than 30 grains of resin to operate upon. All products of *liquidamber* afford cinnamic acid. Benzoin yields none. Is it likely that the resin of *styrax officinale* will? I am using all my endeavors to obtain an authentic specimen of this last, in order to make trial whether it contains cinnamic or benzoic acid. I question whether even the *amygdaloid storax* is the genuine unmixed exudation of *styrax*: it certainly contains cinnamic acid."

This information from Mr. Hanbury appears to settle the long mooted question as to whether or not the acid in this resin is benzoic, and gives a very easy means of distinguishing that acid from the cinnamic.

PHARMACY IN AUSTRALIA.--By a recent number of the Pharmaceutical Journal, we are informed of the organization of a Pharmaceutical Society in Victoria, Australia. This speaks well for the progress of that distant but rapidly rising country, as the organization of apothecaries is one of the last of the processes that occur in the movements of communities. We trust it will be very successful, that it will foster science and be the means of developing much of interest, in reference to the productions of that island-continent hitherto covered with mystery. This is one of the legitimate fruits of that great home movement—the Pharmaceutical Society of Great Britain—than which we know of no more interesting object in the present aspect of the world of Pharmacy.

OBITUARY.—Baron Thenard, another of those great chemists who adorned and illustrated the first half of the nineteenth century, died on the 21st of June, at Paris, after a few days illness, in the 81st year of his age. Until a short period before his death, his health was so vigorous as to promise yet some years of usefulness.

Thenard was born during the epoch of the great discoveries of Lavoisier, Priestly and Cavendish. He was, says Boudet, the friend of Laplace and Berthollet, the cotemporary of Davy, Berzelius and Gay Lussac, the last of whom was his co-worker. He was a professor at the Sorbonne, to the College of France, and the Polytechnic school, and during half a century the historian and interpreter of modern chemistry; he was the devoted protector of true merit and industry in the young, always accessible and kind, and ready to render services to those who sought his aid. He was, at the

time of his death, Chancellor of the University, and one of the most prominent members of the Academy. His large work on Chemistry has long been one of the standard treatises in the science.

TILDEN & Co., OF NEW LEBANON.—We acknowledge the receipt of several specimens from these gentlemen, which were received too late for notice this number. Among them we find Wine of Wild Cherry, Podophyllin, Hydrastin and other items of their class, which present a favorable appearance.

THE DRUGGIST'S RECEIPT BOOK: Comprising a copious Veterinary Formulary, and tables of Veterinary Materia Medica, numerous recipes in patent and proprietary medicines, Druggist's Nostrums, etc., Perfumery and Cosmetics, Beverages, Dietetic articles and condiments, trade Chemicals, &c., with an appendix of useful tables. By HENRY BEASLEY. Third American edition, with numerous additions. Philadelphia. Lindsay & Blakiston. 1857. Pp. 495, 12mo.

This book is an *omnium gatherum* of recipes for various purposes in the arts, pharmacy, medicine, the treatment of horses and other animals, and the diseases of vines, fruit trees, etc., and in household economy, as preserving, pickling, and other processes of a dietetic nature. Every druggist and apothecary must have a book of this kind at hand for reference on many occasions where information is wanted out of the regular line of his business, and for this use we can recommend it as one of the best of its kind.

REPORTS OF COMMITTEES TO THE MASSACHUSETTS COLLEGE OF PHARMACY at the annual meeting, held March 2, 1857. Boston. Pp. 24. Octavo.

This pamphlet has been received.

ERRATA.—Our readers will please insert the following line after the *last* line on the *first* page of the July number.

"ble subcarbonate if the acid be in the smallest degree deficient." It was accidentally put at the bottom of the 2d page.

Also, at page 222, line 32d, of the May number, instead of "Chloride of Sodium," let it read "Chloride of Calcium."

THE
AMERICAN JOURNAL OF PHARMACY.

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NOVEMBER, 1857.  
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PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL
ASSOCIATION—1857.

The Association commenced its Annual Meeting at the Hall of the Philadelphia College of Pharmacy, Sept. 8th, 1857, at 3 o'clock, P. M.

The President of the Association, George W. Andrews, of Baltimore, being absent in Europe, the meeting was called to order by Frederick Stearns, of Detroit, Vice President; W. J. M. Gordon, of Cincinnati, Secretary.

On motion of E. Parrish, a Committee of three was appointed on credentials, by the Chair, consisting of S. M. Colcord, of Boston, John Meakim, of New York, and William Procter, Jr., of Philadelphia, who after a recess reported the following list of Delegates:

From the *Philadelphia College of Pharmacy*—Dillwyn Parrish, Ambrose Smith, William Procter, Jr., Charles Bullock and T. S. Wiegand.

New York College of Pharmacy—John Meakim, Eugene Dupuy, Geo. W. Berrian, Jr., John Canavan and George W. De la Vergne.

Massachusetts College of Pharmacy—William A. Brewer, Charles A. Tufts, S. P. Peck, Charles T. Carney and Samuel M. Colcord.

Cincinnati College of Pharmacy—W. J. M. Gordon, Charles A. Smith, W. B. Chapman, Edward S. Wayne and A. M. Stevens.

Maryland College of Pharmacy—J. F. Moore, I. J. Grahame, J. H. Lemon, Joseph Roberts and J. Jacob Smith.

Pharmaceutical Association of Washington City—F. S. Walsh, S. E. Tyson, Daniel B. Clarke, D. S. Dyson and James N. Callan.

The following gentlemen were reported by the Executive Com-

mittee as having been elected members of the Association during the interim :

William Loeffler, Chambersburg, Pa.	C. K. Gallagher, Washington, N. C.
Eugene L. Massot, St. Louis, Mo.	Wm. B. Little, San Francisco, Cal.
Crawford Blackwood, Columbus, Miss.	Peter V. Coppuck, Mt. Holly, N. J.
John Jackson, Knoxville, Tenn.	H. A. Hughes, Louisville, Ky.
Samuel K. Norgrave, Pittsburg, Pa.	Washington Lacock, Detroit, Mich.
	Matthew F. Ash, Jackson, Miss.

The Chairman of the Executive Committee reported the following gentlemen for membership, who were balloted for and duly elected, viz :

Samuel F. Troth,	Philada.	Thomas P. James,	Philada.
Louis M. Emanuel,	"	Samuel S. Bunting,	"
Samuel N. James,	"	Edward H. Hance,	"
George Cook,	"	William R. Warner,	"
Thomas Lancaster,	"	Evan T. Ellis,	"
Asher S. Leidy,	"	Bradford Ritter,	"

The Secretary then called the roll, and the following members were found to be present, viz :

Henry T. Cummings, of Portland,	Evan T. Ellis,	Philada.
Charles A. Tufts, Dover, N. H.	Bradford Ritter,	"
Henry F. Fish, Waterbury, Con.	William Heyser, Jr.,	Chambers-
Samuel M. Colcord, Boston, Mass.	burg, Pa.	
Anthony S. Jones, Newburyport,	Israel J. Grahame,	Baltimore,
Mass.	J. Jacob Smith,	"
Charles T. Carney, Boston, Mass.	J. H. Lemmon,	"
John Meakim, New York city,	Joseph Roberts,	"
Eugene Dupuy,	J. F. Moore,	"
John Canavan,	James Balmer,	"
Frederick Hale,	D.S. Dyson,	Washington City.
H. T. Kiersted,	R. H. Stabler,	Alexandria, Va.
Charles Ellis,	A. E. Richards,	Plaquemine, La.
William Procter, Jr.,	W. J. M. Gordon,	Cincinnati, O.
Alfred B. Taylor,	Frederick Stearns,	Detroit, Mich.
Edward Parrish,	Samuel F. Troth,	Philada.
Samuel S. Garrigues,	Louis M. Emanuel,	"
Frederick L. John,	Thomas P. James,	"
Samuel N. James,	Samuel S. Bunting,	"
George Cook,	James N. Callan,	Washington city.

Thomas Lancaster, Philada.	S. E. Tyson, Washington city.
Asher S. Leidy, “	Daniel B. Clarke, “
Edward H. Hance, “	John Buck, Chelsea, Mass.
William R. Warner, “	

The Report of the Executive Committee was read by the Chairman, Edward Parrish, and on motion, was accepted, and laid on the table for future action. It is as follows:

The Executive Committee present the following Report of their proceedings for the past year:

The annual publication entitled “*Proceedings of the American Pharmaceutical Association*,” was issued early after the meeting in Baltimore. It comprised ninety octavo pages, and we have an evidence of the interest which it excited in the numerous applications for copies which reached the Committee by mail and otherwise. One thousand copies were published at an expense of \$135 92.

The subject of collecting and placing in a safe repository the manuscript and printed documents of the Association, was referred to us last year, by Resolution, and we have obtained the use of cases in the Hall of the College of Pharmacy, Zane street, Philadelphia, for the purpose. It is cause of regret that so small a stock of the Proceedings of previous years is in our possession, and we propose that the effort be made to procure back numbers to be sent to the Chairman of the next Executive Committee, so that complete sets may be made up for future use.

There have been, since the last annual meeting, sixteen applications for membership. Of these, one was, by the advice of the Committee, withdrawn, eleven were approved by the separate members in writing, and duly elected.

Copies of the Constitution, signed by these applicants respectively, with the required vouchers of Physicians and Pharmacutists, the approval of the Committee, and the endorsement of the President, accompany this report. They are designed to be deposited with the papers of the Association.

The remaining four applicants, up to the time of writing this report, are: George W. Sloan, Indianapolis, Ind.; John M. Clark, Milledgeville, Ga.; William M. Guilford Lebanon, Pa., and P. C. Candidus, Aberdeen, Miss. These have not received the necessary sanction of the President in consequence of his

absence from the country; their applications have been duly approved by the Committee, and they are recommended for election.

During the past year, which has been remarkable throughout the country for the rare occurrence of acute disease, our Association has sustained no loss by death, except in one instance, that of Benjamin Canavan, of New York, (see page 491.)

The following names have been erased from the roll, they having voluntarily relinquished membership by failing to pay their contributions for three successive years, exclusive of the contributions for the current year.

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Your Committee, through Professor Guthrie, propose to make a separate report on the subject of the appointment of Special Examiners, referred to them last year.

EDW. PARRISH *Chairman.*

CHAS. T. CARNEY.

C. B. GUTHRIE.

W. J. M. GORDON.

I. J. GRAHAME.

The following Reports were read by their titles, and laid on the table:

The Report on a Syllabus of a course of study appropriate to the Student of Pharmacy.

The Report upon the subject of Weights and Measures.

The Report on the subject of the Sale of Poisons, &c.

The Report on the Progress of Pharmacy.

The Report on the expediency of the Association taking part in the revision of the Pharmacopœia, was read by its Chairman, Edward Parrish. The Report was accepted, and laid on the table for future consideration.

The Committee appointed to collect, compile and report local unofficinal formulæ in use by Physicians, presented a report, which was received and laid on the table.

The following Committee of one from each College of Pharmacy was selected by the delegations to nominate officers, viz.:

Massachusetts College.—S. M. Colcord.

New York College.—Eugene Dupuy.

Philadelphia College.—Wm. Procter, Jr.

Cincinnati College.—W. J. M. Gordon.

Maryland College.—Joseph Roberts.

Washington Association.—D. S. Dyson.

From the members at large, Edward Parrish, of Philadelphia, H. T. Cummings, of Portland, John Buck, of Chelsea, Massachusetts were appointed by the chair.

On motion, the selection of a room for the meeting of the Association among those in the College Hall was referred to the Local Committee.

The Treasurer's report was presented and laid on the table for future action.

An invitation was received from the Academy of Natural Sciences to visit their Museum, and from the Dean of the University of Pennsylvania to visit their Anatomical Museum, which were accepted and the thanks of the Association tendered.

On motion of Charles Ellis it was resolved that the professors of the Philadelphia College of Pharmacy, not members of the Association, be invited to attend the meeting.

The following gentlemen were proposed for membership by the Executive Committee, balloted for and elected.

William Fiske, Cleveland, Ohio.	Henry N. Rittenhouse, Wilmington, Delaware.
N. H. Jennings, Baltimore, Md.	
Wm. H. Pratt, Philadelphia Pa.	Henry Haviland, New York.
Edward Donnelly, do. do.	Charles H. Eggert, Philadelphia.
John Faber, New York.	James Gordon, Boston.

It was on motion resolved, that when we adjourn we adjourn to 9 o'clock to-morrow.

Vice President Stearns then read the following Annual Address to the Association.

Gentlemen of the American Pharmaceutical Association,—

In the absence of our worthy President, G. W. Andrews, of Baltimore, and of our first Vice President, Mr. Kidwell, it has devolved upon me to state to you the results accomplished by the several Committees appointed at our last meeting, and to invite your earnest attention to the many subjects of importance and interest which will be presented for your consideration and action.

Allow me in this connection to refer with feelings of pride to the present condition of our Association, which, though young in years as an organization, has created for it—through its aims—an interest in the breast of all well disposed Pharmacutists of our broad Union.

Allow me also to congratulate you upon the goodly number, who from the West, the North, the South are here assembled to-day, and assembled with one common object—the elevation and improvement of Pharmaceutical Science. I trust we are all earnest and enthusiastic in our work, and, gentlemen, let us hope that we may soon rank our Association among the most important, useful, and scientific of our country, in the influence it will exert in elevating us as professional men, and in promoting the public welfare. The reports of the Standing Committees—the first, Executive—will show you that our Association is in a most desirable condition of prosperity; the 2d, upon the Progress of Pharmacy, has a digest of numerous interesting facts to offer.

The reports of the special committees, from their completeness, will add valuable matter to the archives of our institution.

We may expect full reports from those to whom the several questions were proposed at our last meeting.

I am also led to believe that several unofficial reports and communications of an interesting and important character will be offered.

Your attention will be called particularly to the importance of appointing a general committee, whose duties shall be to suggest revision and additions to our National Codex at the Pharmaceutical Convention in 1860. The importance of this matter will receive, it is hoped, its due consideration at your hands. It is suggested from the success attending the apportioning of questions to individual members, that this method of obtaining interesting and important documents for the benefit of the Association be continued during the coming year, by the suggestion of new subjects for investigation to individual members.

Much other business will doubtless require your thoughtful and impartial consideration.

In the actions and discussions of this body of workers, I trust to see manifested enthusiasm, earnestness, that our meeting be conducted in a spirit of harmony, consistent with our position and character, and that your efforts will result in permanent good to our growing organization.

Before taking my seat among you, allow me to express my appreciation of the honor with which you were pleased to endow me, as well as my thanks for your present forbearance and courtesy.

On motion adjourned.

Second Day—Morning Session—Sept. 9th, 1857.

The Association was called to order at 9 o'clock A. M. by Vice President Stearns.

The following gentlemen having been proposed for membership by the Executive Committee, were ballotted for and elected:

Elisha H. Perkins, Baltimore, Md. George Syme, New York City.
George W. Sloan, Indianapolis, Ind. Alexander Hudnut, Brooklyn, N. Y.

John M. Clark, Milledgeville, Geo.	T. Morris Perot, Philada., Pa.
William M. Guilford, M. D., Lebanon, Pa.	H. Steiner, Philadelphia, Pa.
P. C. Candidus, Aberdeen, Miss.	John S. Pemberton, Columbus, Georgia.
Charles A. Heinitsh, Lancaster, Pa.	Edwin O. Gale, Chicago, Ill.
Tristram W. Metcalfe, Brooklyn, New York.	William H. Gale, " "
Wm. L. McCorkle, Columbia, Pa.	Chas. E. Heckman, " "
R. F. Lattimer, Jackson, Mich.	T. R. Spence, Detroit, Mich.
Geo. M. Snowden, Philada., Pa.	Wm. H. Peabody, Buffalo, N. Y.
Abraham S. Wiley, Cambridge, Massachusetts.	John T. Fuller, Detroit, Mich.
Eben Blatchford, Rockport, Mass.	Otto Leuschner, Detroit, Mich.
Dexter D. Geyer, Gloucester, Mass.	Alfred S. Lane, Rochester, N. Y.
Thos. Whitehorn, Brooklyn, N. Y.	James D. Paine, Chicago, Ill.
	J. J. Wm. Bowling, Alexandria, Virginia.

The Committee appointed to nominate officers made the following report, which was accepted.

The Committee to nominate officers for the ensuing year, being embarrassed by former precedents and what may be considered an independent course, have deviated so far from the usual practice as to offer for your suffrages three candidates for the presidency instead of one. Our reason for so doing is because this is the first instance of our meeting twice in the same city. By following former precedents we should select our presiding officer from the place of our meeting, and if this course is still pursued it is evident that a president cannot be selected from the rural districts. Although the Association never has and never should sacrifice merit to locality, yet the committee deem the present time a suitable one to make a change in the mode of nomination, and would offer three names, all well qualified; one a resident of Philadelphia, one of a sister city, and a third from a locality having no organized body of pharmacutists.

NOMINATIONS.

For President—Charles Ellis, of Philadelphia, Charles B. Guthrie, of New York, Henry F. Fish, of Connecticut.

1st *Vice President*—James Cooke, Fredericksburg, Virginia.

2d " " S. P. Peck, Bennington, Vermont.

3d " " A. E. Richards, Plaquemine, Louisiana.

Recording Secretary—W. J. M. Gordon, Cincinnati, Ohio.

Corresponding Secretary—Edward Parrish, Philadelphia, Pa.

Treasurer—Samuel M. Colcord, Boston, Massachusetts.

Executive Committee—S. S. Garrigues, Philadelphia, H. T. Cummings, Portland, Joseph Roberts, Baltimore, W. H. Gilman, Washington, W. J. M. Gordon, *Recording Secretary ex-officio*.

Committee on the Progress of Pharmacy—Frederick Stearns, of Detroit, I. J. Grahame, of Baltimore, R. H. Stabler, of Alexandria, Eugene Dupuy, of New York, Edward Parrish, *Corresponding Secretary, ex-officio*.

Respectfully submitted.

Signed,

S. M. COLCORD, and others.

The Chair having appointed John Meakim and S. S. Garrigues tellers, the members proceeded to ballot for President, when

CHARLES ELLIS, of Philadelphia, was elected.

The President elect was then conducted to the chair by its late occupant, and in a few pertinent remarks returned his thanks to the Association for their expression of confidence.

The balloting for officers being continued, the following gentlemen were elected.

VICE PRESIDENTS,

1st. JAMES COOKE,	Fredericksburg, Va.
2d. S. P. PECK,	Bennington, Vt.
3d. A. E. RICHARDS,	Plaquemine, La.

TREASURER,

SAMUEL M. COLCORD,	Boston, Mass.
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RECORDING SECRETARY,

W. J. M. GORDON,	Cincinnati, Ohio.
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CORRESPONDING SECRETARY,

EDWARD PARRISH,	Philadelphia, Pa.
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The *Executive Committee* and *Committee on the Progress of Pharmacy* were elected as above proposed by the nominating Committee, and subsequently these Committees severally elected S. S. Garrigues, of Phila., Chairman of the Executive Commit-

tee, and Frederick Stearns, of Detroit, Chairman of the Committee on the Progress of Pharmacy.

The Secretary was authorized by resolution to employ a Reporter to assist in embodying the discussions and extemporaneous communications for use in compiling the published proceedings. [This resolution did not get carried into effect.]

It was moved by Edward Parrish that the reports of standing and special Committees as introduced, so far as convenient, be printed for the use of the members previously to their being acted upon. Not carried.

On motion of William A. Brewer, it was Resolved, That in the future annual meetings of this Association, the nomination for President be made from the members at large, without regard to the precedent which has hitherto governed us in selecting that officer from the members in the place where said meetings are held.

A communication was received from M. J. Bailey, M. D., late Special Examiner of Drugs, at the port of New York, and laid on the table.

On motion of W. Procter, Jr., it was Resolved, That a Committee of two be appointed to report, to a future sitting, a list of subjects for members to investigate and report on next year.

W. Procter, Jr., and E. Parrish, were appointed by the chair.

It was moved and carried "that the Report of the Committee on the revision of the Pharmacopœia be printed for the use of the members before being acted on," which was carried.

It was moved and carried "that Reports of Committees be taken up in their regular order."

The Committee on "A Syllabus for Pharmaceutical Students," reported through their chairman, W. Procter, Jr., who stated that it was a duty requiring much time, and their labors had not been sufficiently perfected for publication.

On motion, the committee was continued, and requested to report to the next annual meeting; and if ready before that occasion, they were authorized to have the Syllabus printed and distributed to members only, for private examination and suggestions, prior to the said meeting.

On motion, the Chairman read several portions of the report to convey an idea of the character of the work.

The Report of the Committee on Weights and Measures being in order, the chairman, Prof. Guthrie, asked permission, which was moved and carried, that the first hour of the afternoon sitting be allotted to the reading of his report.

The Report of the Committee on the sale of Poisons, and the legal means of restraining it, was read by the Chairman, S. S. Garrigues, accepted, and referred to the Executive Committee for publication.

The Chairman of the Committee on Home Adulterations made some verbal remarks, stating that they had made no written report, owing to sickness, to the want of co-operation by other members of the Committee, and to the difficulties to be overcome in reporting facts and names, which had prevented it.

On motion, the Committee was discharged, and a new Committee nominated and elected, consisting of C. B. Guthrie, of New York, Alfred B. Taylor, of Philadelphia, Chas. T. Carney, of Boston, Alpheus P. Sharp, of Baltimore, and Wm. Fiske, of Cleveland.

On motion, adjourned to meet at 3 o'clock, P. M.

Second Day—Afternoon Session.

The Association was called to order at 3 o'clock, P. M., by the President, Charles Ellis.

The first business in order being the Report of the Committee on Weights and Measures, Prof. Guthrie read the document, and illustrated it with numerous tabular diagrams.

On motion, the Committee was continued, William Procter, Jr., and John Meakim added to it, and it was authorized to act with Committees from other bodies on the same subject.

The Report of the Committee on Unofficial Formulæ was presented and read by its chairman, John Meakim. The report was accepted and referred to the Executive Committee for publication, with discretionary power.

On motion, the Committee was discharged, and the following Committee appointed, viz: John Meakim, New York, Alpheus P. Sharp, Baltimore, Edward Parrish, Philadelphia, W. S. Brewer, Boston, W. H. Peabody, Buffalo, H. A. Blauw, Rochester, W. H. Gilman, Washington, Joseph Laidley, Richmond, Wm. B. Chapman, Cincinnati, Wm. Fiske, Cleveland, James

Paine, Chicago, G. T. Chamberlain, St. Louis, T. R. Spence, Detroit, J. S. Melvin, Boston.

The communication from H. J. Bailey, M. D., of New York, referred to the Executive Committee this morning, was read and laid on the table.

The Report of the Executive Committee of last year was again read, and was adopted.

The Report of the Committee on the Progress of Pharmacy, was presented by W. Procter, Jr., Chairman of the Committee, who read various portions of the report, (the whole document being too long) so as to give the meeting an idea of its contents. Appended to this report was a statement by the present Drug Examiner at New York, Dr. Merkle, exhibiting the kinds and amount of drugs passed daily from June 1st, to August 31st, 1857, which was furnished at the request of a member of the Committee. The whole was referred to the Executive Committee.

On motion of T. S. Wiegand, it was Resolved, That the Report of the Committee on the Progress of Pharmacy be accepted, and that the thanks of the Association be tendered to that committee for their very able and interesting report, and that it be published in the proceedings in extenso.

The Report of the late Treasurer was read, and on motion was referred to a committee of two to audit, consisting of C. B. Guthrie and T. S. Wiegand.

Hennell Stevens, of Philadelphia, was proposed by the Executive Committee, and elected a member of the Association.

On motion, adjourned to meet at 9 o'clock to-morrow morning.

Third Day—Morning Session—Sept. 10th, 1857.

The Convention was called to order by the President. The Secretary called the roll, and read the minutes of the preceding meeting, which were adopted.

The attention of the Association was called by J. Meakim to the decease of one of its members, *Benjamin Canavan* of New York, in the following preamble and resolution, which were adopted and directed to be embodied in the minutes :

Mr. President,—While we have cause for thankfulness that during the past year the members of our Association generally have enjoyed health; it becomes my mournful duty to announce

to you that death has removed from us since our last meeting one of our most valued members. Benjamin Canavan, of New York, died in October last from hemorrhage of the lungs. Although attending to his duties until the day preceding his death, he had been infirm for many months previous, which prevented his active co-operation with us. He was a model pharmacist, and one of the noblest works of God, an honest man.

As a tribute of respect to his worth, permit me to offer the following :

Resolved, That the members of this Association have heard with regret that death has deprived them of their fellow member Benjamin Canavan, of New York. In his death our science has lost an ornament, and our Society a useful and respected associate.

An invitation was received by the Local Committee, inviting the members to an excursion to Laurel Hill, Fairmount, and other places, which was considered, and on motion it was resolved to accept it, and that it take place to-morrow afternoon.

The consideration of scientific subjects being now introduced, the reports of special investigations referred last year were called up seriatim, beginning with the following ;

1. What are the actual sources of the light Cod-liver Oil of American commerce, both as relates to the species of fish that yield it, and the places where it is extracted ? Is it adulterated with sperm or fish oil ? and if so, is it done by the producers or collectors, or after it enters commerce ?

Robert R. Kent of Boston not being present, Charles T. Carney of Boston made the following verbal statement :

In relation to Mr. Kent's paper on cod-liver oil, I would say that he entered upon the investigations of this subject very soon after our last meeting in Baltimore, and during several months of the last Fall and Winter he personally visited the fishing ground, and prepared from cod-livers of his own obtaining some very fine light oil, the most beautiful I ever saw. Mr. Kent made some quite singular discoveries in relation to the yield of this article from the livers ; thus at one time the yield would be exceedingly large ; and in a month, the same amount by weight of the livers apparently equally promising would yield scarcely any.

After collecting much information on this subject and many

statistics, Mr. Kent was so unfortunate as to suffer the loss of his shop by fire, and his specimens, papers, &c. on this subject were destroyed. I would recommend the Association to allow this question to remain simply unanswered, and will express the hope that the ensuing year Mr. Kent may be able to re-collect his memoranda, and at the next annual meeting favor us with the result of his investigations.

The request of Mr. Carney was acceded to, and Mr. Kent encouraged to pursue the course indicated.

2. The substance known in commerce as New England Isinglass, is said to be made from the intestines of the codfish. Query, where, and by whom, is the article of commerce prepared, what process does it undergo, what portions of the fish yield it, and what amount is obtained from a single fish?

This question was fully reported on by Charles T. Carney of Boston, which was accepted, referred to the Executive Committee for publication, and the Reporter requested to continue his inquiries and report next year in reference to the isinglass produced by the sturgeon and other fish in the great fresh waters of northern North America. [This report will be found in the sequel.—EDITOR.]

3. Has Iodine been manufactured in New England, from the Algæous plants of that coast? If so, by whom, and to what extent? and what is the relative productive value of the Algæ of our own coast and those of Scotland?

H. T. Cummings, of Portland, to whom this subject was referred, said that last year, when about entering on the duty, he was informed that Thomas B. Porteus, of Boston, had already been engaged on that subject; that he saw Mr. Porteus, and urged him to prepare a paper in answer to the question of the Association, which he agreed to do, and he understood that the paper was in the hands of one of the Boston Delegates.

Mr. Colcord, of Boston, then made some remarks, showing that but little had been done in this country, owing to the difficulties of collecting the right species of sea weed—the iodine plants being those growing in deep water, always submerged, and only torn up from their native recesses by the violence of periodical storms, whilst those of the shore rocks contain but little iodine salts. He then read a long paper by Mr. Porteus,

on the actual history of the iodine manufacture of Europe, giving all the details of manufacture, statistics, etc., wanted, to aid any who may feel disposed to enter on the production in this country.

The paper of Mr. Porteus was referred to the Executive Committee, and the thanks of the Association directed to be tendered to the author. [See the sequel for this paper.—EDITOR.]

An invitation was received from Peter Williamson, Esq., Grand Master of Masons for Pennsylvania, to visit their Hall, which was accepted for this afternoon, with thanks for the courtesy.

Also, an invitation from Dr. Joseph Parrish, Superintendent of the Pennsylvania Training School for feeble-minded children, was accepted, and similarly disposed of.

4. The manufacture of Castor Oil as a branch of American industry. What is the estimated crop of beans for 1856, where grown, and what the amount of oil extracted up to August 1st, 1857? To what uses besides medicine is the oil put, and how far short of the domestic consumption is the production?

No communication having been received from Mr. Chamberlain, of St. Louis, to whom it was referred without permission, the subject was dismissed from the list.

5. It is said that *Hyoscyamus niger* has become naturalized in some parts of Michigan, in the neighborhood of Detroit. How does the medicinal power of this native grown plant compare with that of the best European grown drug?

Was reported on by F. Stearns, of Detroit, who read the report, and illustrated it with specimens of the plant, and several pharmaceutical preparations from it and the foreign leaves.

The paper was referred to the Executive Committee for publication.

6. What is the actual state of the production of volatile oils in the United States, and more especially in Ohio, New York, and New Jersey, as regards quantity, quality, and locality, together with remarks on the trade in volatile oils generally; their adulterations and tests.

This subject was accepted by E. S. Wayne, of Cincinnati, but no report being received, it was dismissed from the list.

7. What measures, if any, have been taken to introduce the culture of liquorice root into the United States, and to what extent have they succeeded?

This paper was referred without permission to Mr. Laidley, of

Richmond, from whom no report having been received it was discontinued.

8. Prof. Calvert, of Manchester, England, has asserted that the article known as "American lard," in the English market, is sometimes found adulterated to a considerable extent with the pulp of potatoes, or other starchy matter. *Query*, has this adulteration been noticed in the commerce of this country? If so, how is it most easily detected by chemical or other means?

This question was reported on by Prof. Grahame, by whom it was accepted, and the report referred for publication.

9. Arnica flowers are largely used in the United States. Has any attempt been made to cultivate the plant in New York, New England, or other parts of this country, by the Shakers or others?

W. J. M. Gordon, of Cincinnati, reported on this subject in the negative, and his report was referred to the Executive Committee.

10. The medicinal power of *Cimicifuga* is generally admitted, its use is increasing, it belongs to a natural family, (*Ranunculaceæ*) embracing many active plants containing alkaloids, and yet the attempts hitherto made have not educed any distinct active principle. *Query*, to what distinct principle, if any, is the medicinal power to be attributed?

11. It has become proverbial that *Digitalis* of American growth has not the same amount of sedative power as the European leaf. *Query*, does American *Digitalis* yield a less proportion of digitalin than the imported, and is such digitalin equally active with that from the foreign plant.

These two questions were accepted by E. S. Wayne, of Cincinnati, from whom no response has been received. As Mr. Wayne had taken steps to produce these papers, and intended to have been at this meeting, these queries were continued over to another year in his charge.

12. The *Elaterium* plant grows readily in Philadelphia. Can it be availably cultivated with a view to the extraction of its peculiar product; and does the *Elaterium* it yields compare favorably with the English drug?

Edward Parrish read the answer to this query, and it was referred to the Executive Committee.

13. According to the most recent researches on Ergot by Winckler, that chemist obtained an alkaloid from it, which he believes to be analogous, if not identical, with propylamin, the odorous principle of herring pickle. It

is desired that the questions be determined, 1st, whether the volatile alkaloid of Ergot possesses the utero-stimulant power of the drug itself? 2d, Whether propylamin as obtained from herring pickle and from narcotin, possesses the same power as secalin? and 3d, in view of the result, what is the best formula for preparing a permanent fluid preparation of Ergot that will *fully* represent the drug?

W. Procter, Jr., made the report on this query, and exhibited specimens of muriate of secalin and fluid extract of Ergot. The paper was referred for publication to the Executive Committee, and the author requested to continue his attention to the subject, and report next year on those points not reached in the paper.

14. What is the correct history of the production of hemlock or Canada pitch, U. S. P., where chiefly produced, how extracted, and is it obtained by incision; also, where is the commercial oil of hemlock produced; is it the oil of the leaves; and what is the proportion yielded?

Charles T. Carney, reported verbally on this subject, that the information he was able to obtain was so unsatisfactory as not to justify him in making a written report. The oil of hemlock is obtained by distillation with water from the young boughs of *Abies canadensis*, but whence commerce is supplied or what is the yield of the leaves, he was not able to determine.

It was on motion carried to suspend the further reading of scientific papers till the afternoon session, and proceed to the regular business.

The report of the Committee "To consider and report upon the expediency of the Association participating in the work of the next decennial revision of the Pharmacopœia," being in order, it was on motion considered by paragraph.

The report is as follows:

That we should have a part in the decennial revision of the Pharmacopœia is pre-supposed by the resolution under which we stand appointed, and is in fact generally conceded, but how the cumbrous machinery of a national organization can be adapted to a work requiring such constant comparison of views and so many precautions and experimental researches, claims, and has received, our deliberate consideration. As a result of this we are prepared to recommend the following propositions.

1st. That a Committee of ten (10) members, shall be appointed at the present meeting to represent the pharmaceutical

knowledge and skill of the Northern, Southern, Eastern and Western States in a preliminary revision of the Pharmacopœia.

2d. The members of this Committee shall transmit to its Chairman, at least two months before the assembling of the Association, in 1858, such additions, modifications and omissions as a careful study of the Pharmacopœia, and their knowledge of the wants of their several localities, and of the profession at large, may suggest. From these the Chairman shall compile a report.

3d. At the meeting, in 1858, the report of the Committee of ten shall be received, but not acted on finally ; it shall be referred to a Committee of three, elected by the Association, who shall thoroughly revise it, and subject each item to criticism and the test of experiment. They shall, at their discretion, omit or modify any of its parts, and make report at the meeting in 1859, when their proposed modification of the Pharmacopœia shall be finally acted on by the Association, and if adopted, directed to be forwarded to the Convention for revising the Pharmacopœia, to meet in Washington, in May, 1860.

4th. The Association not being included in the classes specified as entitled to representation in the Pharmacopœial Convention, it is recommended that the report or the revision, after being adopted by it, shall be placed in the hands of the delegates from one of the Incorporated Colleges of Pharmacy, to be by them offered to the acceptance of the Convention.

Your Committee believe that whatever might be the fate of the modifications suggested in this way to the Convention and its Committee, good would undoubtedly result from a plan adapted to draw out so free an expression from the widely separated localities represented, and to subject these to a rigid examination in the hands of a competent Committee of revision.

Believing that this Association, representing, as it does, a large body of those for whom the Pharmacopœia is ordained, and who have no other channel through which to be represented in its revision, will naturally be looked to, in the future, to co-operate in giving authority to our National Code ; and that the important interests it has in charge, generally, will be promoted by giving to its organization the sanction of law and such a permanence of location as will not entirely interfere with its migratory character ; it is suggested that a charter should be

obtained from Congress and a permanent depository established in Washington, D. C., at which Capital the meetings should be held at intervals of perhaps five years, the intermediate meetings being changed annually as at present.

These suggestions, though not strictly within the scope of this report, are induced by the prospect of a representation in the Pharmacopœial Convention, and are submitted for the consideration of the Association, by

EDWARD PARRISH,
W. B. CHAPMAN,
SAML. M. COLCORD,
JOHN MEAKIM.

On motion the first and second propositions were taken up, fully discussed, and adopted.

On motion, it was ordered that a committee to nominate ten members for a Pharmacopœia Committee, and report at a future sitting, be appointed by the Chair. This duty was entrusted to Frederick Stearns, W. Procter, Jr., and S. M. Colcord.

The *third* and *fourth* propositions were, after considerable discussion, laid on the table until the next annual meeting.

The Executive Committee now made a special report in reference to the subject of Drug Examiners, in obedience to a duty referred to them last year. From the Report it appears that the Committee addressed a letter on behalf of this Association to the Hon. Howell Cobb, Secretary of the Treasury, and similar action was taken by the Massachusetts College of Pharmacy, backed by the Medical Society of that State, which appears to have received no consideration, as, since that event the long tried Examiner at New York has been displaced, under circumstances which convince the Committee that government continues to look upon the office of Examiner of Drugs as a fitting reward for political partizans, rather than as a highly important guardianship of one of the most important interests of the whole country.

The Committee also recommended an application to Congress, to so modify the law as shall make the appointment require the assent of the U. S. Senate, in furtherance of which view the following resolution was adopted and referred to the Executive Committee :

“ *Resolved*, That a Committee be appointed to memorialize

the next Congress in the name of this Association, for such amendments to the drug law as shall place it upon a better basis, and make it a more effectual protection to the community and the interests of the apothecaries."

Then adjourned to 3 o'clock, P. M.

Afternoon Session.

The Association was called to order by the President at 3 o'clock.

On motion, a committee was appointed, to examine and report on the various specimens and apparatus on exhibition in the Hall, consisting of S. M. Colcord, W. Procter, Jr., and J. Meakim.

O. S. Hubbell, of Philadelphia, was proposed, balloted for, and elected a member of the Association.

A resolution to provide for the better preservation of the documents of the Association was laid on the table.

The appeal brought forward by the Committee on Poisons as an appendage to their report was again read, and by resolution adopted, and directed to be published in the proceedings.

AN APPEAL TO THE PHARMACEUTISTS AND DRUGGISTS OF THE UNITED STATES.

The American Pharmaceutical Association, at the suggestion of a committee appointed by it to report upon "*the subject of the Sale of Poisons*," does respectfully submit to the Pharmacutists and Druggists of the United States the following suggestions, in relation to regulating the sale of poisons :

From the diversity of opinion among Pharmacutists in relation to the value and force of direct legislative action in restricting the sale of poisonous substances, the Association does not deem it desirable to attempt at present the passage of laws in the different States bearing upon the subject ; but in place, offers to the Pharmaceutist such suggestions as are deemed expedient under existing circumstances.

The Association suggests, That the Pharmaceutist should adopt rules in dispensing of poisons, by which he may remove from himself the responsibility of selling poisons for disreputable purposes, and protect the public, both from mistakes occurring in his own premises, and from the use of poisons for unlawful and criminal purposes.

The Association therefore offer the following suggestions :

That, in selling any substance which would prove fatal in a dose of 60 grains by weight, or a fluid drachm by measure, you consider it *poisonous*,

and mark the word "poison" in a distinct and unmistakeable manner upon the label or package.

That you consider the poisonous alkaloids and the like powerful substances *deadly poisonous*, and so mark each package or label.

That you make it an invariable rule, to have every package of medicine dispensed at your counter plainly marked, whether it be an innocent or poisonous one.

That you, for the purpose of distinguishing by the aid of color as well as words, have the labels of the furniture of your establishment which contains poisonous substances, (as designated in this paper,) of a peculiar color, one distinct from that of the rest of your labels. That you keep such furniture by itself, in order that it may not cause remark by customers; or, that in place of this suggestion, you adopt the practice of placing upon each bottle, or drawer, or package, of such poisonous substances, some symbol, such as a bright red piece of paper, a triangle, or Greek cross, or of other suitable form, thus giving the eye an additional means of cautioning you when handling such substances.

That you print your dispensing labels for poisons upon a paper of an entirely distinct color from that upon which your ordinary ones are printed.

That in dispensing prescriptions containing poisonous substances, while you cannot mark such "poisonous" unless so directed to do by the writer of the recipe, yet by marking a symbol in red ink upon the label of the medicine, you may avoid any mistake in its reparation, in putting up a poisonous for an innocent one.

That, as an additional precaution, you adopt the practice of placing bands of rubber around the necks and over the stoppers of bottles containing poisonous medicines in frequent use, or in some other manner delay slightly the opening of the bottle, so as to form an additional security and caution against mistake.

That in preparing prescriptions you adopt this course: first, carefully and understandingly read the recipe; then prepare it; then copy the recipe into a book provided for the purpose, with its date; name of prescriber and name of patient and directions; finally, place the number corresponding to the one on record upon the original recipe and the label, before delivering the medicine. In this way any possible error in first reading the recipe may be discovered in recording it; and secondly, you have a guide in the patient's name, by which you may avert evil consequences, should an error be discovered after the medicine has left the store.

That you provide yourself with a book, in which to record every sale of poison, stating in each entry the date of sale; to whom sold; for what purpose desired; the quantity sold, and price received. This can be used as evidence in case of any blame being attached to you in case of accident resulting from articles purchased of you.

That you consider yourself morally responsible to the community in which you live, when there may be no legislative control to the sale of

poisons, and that you be particular when furnishing poisons to applicants for such, to assure yourself by the appearance of the customer and by proper enquiry of them, that no disreputable, illegal or criminal purpose is intended.

That you require a written order from a physician or other responsible party to accompany any application for a poisonous substance presented by a person under fifteen years of age.

That in all cases in dealing out poisons in your business to applicants in person, you be particular to caution them in regard to the properties and proper methods of employment of the substance which they are to receive.

That you entirely refuse to dispense oils of savine and tansy, of ergot, and of substances of similar effect upon the economy, unless upon the written prescription of a physician.

The Association is led to believe that no legislation upon this subject, however strict, will completely protect the public against the acts of the evil doer, in employing poisons to attain his purpose. Yet it trusts that this appeal to pharmacutists, many of whom may not yet have felt the force and weight of the responsibility resting upon them, will awaken them to a sense of their accountability, morally and otherwise, and be conducive to individual safety and public welfare.

The committee appointed to nominate ten persons to carry out the views of the Association in reference to the revision of the Pharmacopœia, reported the following, viz :

For the New England States—Charles T. Carney, of Boston ; James Melvin, of Boston ; and Henry F. Fish, of Waterbury, Connecticut.

For the Middle States—John Meakim, of New York ; Edward Parrish, of Philadelphia ; I. J. Graham, of Baltimore.

West and North West—F. Stearns, of Detroit ; W. J. M. Gordon, of Cincinnati.

Southern States—A. E. Richards, of Plaquemine, La. ; Robert Battey, M. D., Rome, Georgia.

Which were accepted as the committee for that service.

Samuel Chapman, of Philadelphia, was proposed and elected a member of the Association.

It was on motion Resolved, That the suggestion of the Executive Committee of the past year in regard to an act of incorporation from Congress for the Association, be referred to the Executive Committee.

D. L. Dyson, of Washington, presented a blank copy of the certificate of membership of the Pharmaceutical Association of

the District of Columbia to the Association, on behalf of the body he represented, which was accepted.

The reading of scientific papers being in order, R. H. Stabler, of Alexandria, read an answer to the following question.

15. On what proximate principle does the anthelmintic power of *Spigelia* depend; is it volatile, and is the odor of the drug a good criterion of its quality; is said principle soluble in water; and what effect have the carbonated alkalies upon it?

The paper was referred to the Executive Committee for publication. [See the sequel for this paper.]

16. Dr. Wright, of Kentucky, has recently recommended the bark of *Liquidamber Styraciflua*, as a remedy in diarrhœa and dysentery, made into a syrup with cold water. He likewise states that the resinous exudation which this tree produces at the South, is obtainable by incision from the tree in the States bordering on the Ohio river, and that the Kentucky product contains benzoic acid and *Styracin*. It is desirable to have the latter statement corroborated; and if verified, the percentage of benzoic acid it will yield, and the practicability of obtaining it as an article of commerce.

Valentine Harbaugh, of Washington, not having reported on this subject, Prof. Procter made a verbal statement that Daniel Hanbury, of London, had answered the question so far as to determine that the acid in this resin of liquidamber is not benzoic but cinnamic acid.

17. To what extent is the fecula of the *Maranta arundinacea* produced in the States of Georgia and Florida, and what impediments prevent its being made to rival that of Bermuda, in beauty and excellence?

This subject was referred, without permission, to Robert Battey, of Georgia, but no report has been received.

18. What are the most approved methods of rendering medicines palatable to the taste and pleasing to the eye?

Frederick Stearns, of Detroit, read a long and interesting report on this subject, illustrated by various specimens of glyceroles or syrups in which glycerin takes the place of sugar—remarkable for transparency and beauty.

This paper elicited many remarks, and was directed to be published in the proceedings.

19. What are the present sources of *Senega*, *Serpentaria spigelia* and other prominent American roots, etc., as supplied in commerce?

C. B. Guthrie, to whom this subject was referred, not being ready to report it was continued to him till the next Annual meeting.

The Committee appointed to prepare a list of subjects for investigation, reported progress, and were requested to report in full in the morning.

On motion of Wm. A. Brewer, of Boston, it was ordered that a copy of the proceedings of this Association be addressed to each of the Boards of Trade in our principal cities, to the several medical and scientific societies in the several States, and to the Smithsonian Institution at Washington, together with such educational institutions as the Executive Committee, who shall have charge of this matter, may direct.

Then adjourned to 8 o'clock this evening.

Evening Session.

The Association was called to order by the President at 8½ o'clock, who stated that the object of the meeting was chiefly for hearing extemporaneous and other communications.

Charles A. Heinitsh presented the notes of a case of strychnia poisoning, which were read and laid on the table.

On motion it was voted,—That the thanks of this Association be tendered to James T. Maxwell, of New York, for a handsome specimen of *Myristica*—nutmeg and mace—preserved in alcohol.

It was moved and carried that the discussions for the remainder of this session be limited to ten minutes for each member.

A paper was read by Edward Parrish, on "Ethical Analysis," which was accepted and referred to the Executive Committee.

This paper elicited considerable discussion, and on motion it was Resolved, That Edward Parrish be requested to answer the questions contained in his paper just read, and that other members be requested also to answer them, at the next annual meeting.

Frederick Stearns read a paper on Citrate of Magnesia, and another on the production of leeches in Michigan; the latter paper was illustrated by living specimens of two species of indigenous leeches, exhibiting the mode in which the young are developed on the abdomen of the parent.

These papers were accepted and referred for publication.

On motion it was Resolved, That the following committee be

appointed to memorialize Congress to amend the Drug Law, to act instead of the Executive Committee, viz.

C. B. Guthrie of New York, Wm. A. Brewer of Boston, and Richard H. Stabler of Alexandria.

Wilson H. Pile, M. D., of Philadelphia, was proposed by the Executive Committee and elected a member.

On motion adjourned to meet at 9 o'clock to-morrow.

Fourth Day—Morning Session—Sept. 11th.

The Association was called to order by the President.

This being the last session of this annual meeting, it was moved and carried, that calling the roll and reading the minutes be dispensed with.

On motion of Edward Parrish it was resolved,—That a handsomely bound copy of “Dorvault’s l’Officine” be voted to Frederick Stearns of Detroit, for his able paper “on Eligible Modes of rendering medicines palatable and pleasing,” which was unanimously carried.

Elias Durand, of Philadelphia, was proposed by Charles Ellis, W. Procter, Jr., and Dillwyn Parrish for honorary membership. A ballot was held, which resulted in an unanimous election.

The Committee appointed to examine the various articles on exhibition to the Association, made the following report:

To the American Pharmaceutical Association:—

The Committee appointed in reference to the articles on exhibition to the Association, report, that they find a variety of chemical preparations, and chemical and pharmaceutical apparatus, together with numerous specimens of minor interest, arranged on the tables. The Chemicals from Messrs. Rosengarten & Sons include forty-one varieties, among which we would particularly notice Sulphate of Quinia, Nitrate of Morphia, Nitrate and Acetate of Strychnia, Valerianate of Morphia, Piperin, &c. Those from Powers & Weightman are particularly rich in alkaloids and their salts, among which are pint bottles of Codeia, Morphia, Cinchonia, Strychnia in crystals, Sulphate of Quinia, Morphia and Quinidia, in gallon and two gallon bottles, Caustic Potassa, Iodide of Arsenic, and beautifully crystallized Iodides of Lead and Mercury. Messrs. Garrigues, Magee & Mayer, exhibit Pyrogallic Acid, Bromide and Iodide of Cadmium, Bromide and Iodide of Ammonium, and Nitrate of Magnesia. Messrs. Bullock & Crenshaw’s collection includes several of interest, as Bi-sulphuret of Tin, Oxides of Chromium and of Nickel, Sulphate and Carbonate of Nickel; Nitro-prusside of Sodium, and Molybdate of Am-

monia. Hennel Stevens' group, though not numerous, is particularly *recherché*, consisting of Valerianic Acid, Valerianate of Ammonia, Amylene, Iodide of Ethyl and Iodoform. Dr. W. H. Piles' collection of Hydrometers and Specific Gravity Bottles attracted considerable attention. S. P. Peck, of Bennington, Vermont, exhibited specimens of Porcelain and Wedgewood Mortars and Funnels, of Vermont manufacture. Among the other objects of interest we observed a small Beindorf apparatus; a Nichols' patent improved Combination Fountain, with draught apparatus and coolers, deposited by T. M. Perot & Co.; a beautiful block tin Still and Condenser, Gas-burners, Lamp stands, Lamps, &c., from Garrigues, Magee & Mayer, of Philada.; and a variety of Syrups, for mineral water, by E. H. Hance, of Philadelphia. The quality and beauty of a great proportion of the Chemicals exhibited demands our unqualified approval, and speaks well for this branch of American manufactures.

SAML. M. COLCORD,
W. PROCTER, JR.,
JOHN MEAKIM.

On motion, the report was adopted and referred to the Executive Committee.

The following resolution, offered by John Buck of Massachusetts, was carried without dissent.

Resolved, That the thanks of the American Pharmaceutical Association be respectfully tendered to the Philadelphia College of Pharmacy, for the ample accommodations with which we have been provided and the very agreeable manner in which we have been entertained.

The following was offered by Prof. Procter :

Whereas, the dispensing of medicines on the extemporaneous prescription of physicians is the most important of the duties of the pharmacist, involving a large amount of ready knowledge and skill, and as the demand for this knowledge is very frequently required at a moment's notice, when delay might seriously retard the recovery of the patient and impair the usefulness of the physician, and as the feeling of responsibility, at all times great, becomes often oppressively burdensome through the careless manner in which prescriptions are frequently written, and their quantities symbolized, it is hereby

Resolved, That this Association, speaking for the pharmaceutical profession of the United States, do most respectfully and earnestly desire that the grave importance of this deficiency,

and the many evils which arise out of it in the dispensing of medicines, will claim anew the action of the Medical Societies of the United States, with a view to influencing those of their members to whom the charge applies; and while fully aware of the numerous imperfections which appertain to our own practices and practitioners, and which we are striving to overcome, we believe that the co-operation of physicians in the manner suggested will greatly aid our endeavors.

The resolution was adopted.

A paper on indigenous plants, by J. M. Maisch, of Philadelphia, was read, accepted and referred to the Executive Committee.

Dr. Geo. B. Wood and Dr. Franklin Bache were proposed by S. P. Peck, W. J. M. Gordon and Chas. Ellis, for honorary membership, and unanimously elected.

The following resolution was offered by James Gordon :

Resolved, That the thanks of this Association are due, and are respectfully tendered to the President, for the efficient and impartial manner in which he has presided over our deliberations, to the Secretary for the able manner in which he has performed the arduous duties of his office, and to the late second Vice President for his attention to the duties of the chair during the organization of the meeting.

The resolution was agreed to.

On motion, the resolution of Prof. Guthrie, fixing a place of meeting, was called up, and the following resolution was offered and carried.

Resolved, That the next meeting of this Association be held in the city of Washington, on the second Tuesday of September, 1858, at 3 o'clock, P. M.

[It should be observed that an invitation had been previously extended by S. E. Tyson of the Washington Delegation, inviting the Association to meet next in that city.—EDITOR.]

The list of subjects for investigation during the ensuing year being now ready, they were read, with the names of the acceptors or referees, and adopted by the Association.

The Report is as follows:—

The Committee appointed to bring forward subjects for investigation during the ensuing year offer the following, viz :

1. The medical plants of Michigan.

Accepted by Frederick Stearns, of Detroit.

2. The process of displacement or percolation; what are the conditions and precautions which will give it the greatest simplicity and efficiency as a means of extraction in practical pharmacy?

Accepted by Prof. I. J. Grahame, of Baltimore.

3. What are the best means of keeping the vegetable extracts, and especially those from narcotic plants, in the dispensing shop, so as to avoid to the fullest possible extent the inspissation and alterations to which they are subject by unavoidable exposure in dispensing?

Accepted by Prof. I. J. Grahame, of Baltimore.

4. Liebig (Agricultural Chemistry, American edition, page 184,) says that the nicotina of commercial tobacco does not pre-exist in the growing plant, but is the result of the fermentation set up during the curing process. Question,—If this be true, what is the active principle of green tobacco, and what relation does it bear to nicotina?

Accepted by Wm. Procter, jr., of Philad.

5. Wine of Ipecacuanha. What is the cause of its tendency to deposit a sediment—has that sediment any medical value—and can the deposition be avoided by substituting another menstruum of the strength of wine?

Accepted by Joseph Roberts, of Baltimore.

6. Blue pill mass is coming into use in the form of powder. Question,—Does the condition of the mercury undergo any change by the ordinary exposure in the shop, as regards oxidation—does this powder, after being prepared a year, contain any red oxide of mercury—and what is the best process for its preparation?

Accepted by Charles Bullock, of Philadelphia.

7. The subject of coating pills with sugar, mucilage, gelatin and other soluble substances, so as to mask their taste, is becoming of some importance in practical pharmacy. Question.—What are the best materials for this purpose; and what the best and most practicable process for effecting it, both on a large scale, and extemporaneously in the course of dispensing?

Accepted by John Canavan, of New York.

8. The preparation of Saccharides, or sugar in the form of powder and granules, impregnated with medicinal substances, so as to facilitate their administration. What is the best process or processes applicable to this object; and what is the best proportion of sugar to include a dose of the respective drugs or preparations?

Accepted by Eugene Dupuy, of New York.

9. Mustard. What is the best formula for a permanent liquid preparation of white or black mustard seeds that may be used as a substitute for mustard plasters?

Accepted by Edward Parrish, of Philadelphia.

10. Podophyllin is alleged to be analogous to Jalapin in its medical and some of its chemical relations. Question,—What is the correct chemical history of Podophyllin, as regards its solubility in menstrua, its relations to the alkalies, and other agents, &c., and why may it not be advantageously substituted for extract of jalap in the compound cathartic pill, and for scammony in the compound extract of colocynth?

Accepted by R. H. Stabler, M. D., of Alexandria.

11. Dr. Stenhouse has investigated the volatile oil and stearoptyne of Xanthoxylum piperitum or Japanese pepper. (See Am. Jour. Pharm. Sept., 1857.) Question,—1. What is the true botanical source of what is called "Southern Prickly Ash bark?" 2. Does the pungency of that bark and the bark and fruit of Xanthoxylum fraxineum of our Pharmacopœia depend on the same principles?

Referred to Edward S. Wayne, of Cincinnati.

12. What influence is exerted in the *normal* solvent power of officinal water, alcohol and ether, by their admixture with each other as pharmaceutical menstrua, in regard to the solution of various vegetable principles, (like gum, sugar, starch, albumen, resins, volatile oils, etc.,) desirable or to be avoided in making preparations?

Accepted by Wilson H. Pile, M. D., of Philadelphia.

13. A monograph on the Cerasus serotina, or wild cherry bark, tree and its products useful in medicine.

Accepted by Wm. Procter, Jr., of Philadelphia.

14. The Brazil nut of South America yields a fixed oil in abundance. Question, How and to what extent is it manufactured in Brazil, to what uses put; and whether, is it applicable or not to the uses of olive oil in Pharmacy?

Accepted by Edward Donnelly, of Philadelphia.

15. Are the barks of Cornus florida and other species of this genus, due to a crystalline substance? Is this principle alkaline, acid or neutral? Will it answer as a substitute for Quinine? and can it be advantageously manufactured at a low price?

Accepted by John M. Maisch, of Philadelphia.

16. There being great diversity in practice as regards the powder to be employed in rolling pills:—Question, What is the best powder or compound of powders, uniformly to be used in rolling pills, not required to be masked or coated with sugar, gelatin, or other substance?

Accepted by William A. Brewer, of Boston.

17. The refraction of light by the English Essential Oil of Bitter Almonds being often regarded as an important proof of its purity:—Question, What is the value of this phenomenon of iridescence of Essential Oil of Bitter Almonds as a test of its purity?

Referred to John T. Fuller, of Detroit.

18. What is the correct history of the production and sources of supply of Hemlock or Canada pitch, of Balsam of Fir, and of Oil of Hemlock; and to what extent are they produced in the New England States and Canada?

Accepted by S. P. Peck, of Vermont.

19. The Elaterium plant grows readily in the neighborhood of Boston. Can it be availably cultivated with a view to the extraction of its peculiar product, and does the Elaterium it yields compare favorably with the English drug in medicinal power.

Accepted by John Buck, Chelsea, Massachusetts.

20. To what extent is the fecula of Maranta Arundinacea produced in Georgia, Florida, and other Southern States, and what impediments prevent its being made to rival that of Bermuda in excellence and beauty.

Continued to Robert Battey, M. D., of Rome, Georgia.

21. What is the extent of the culture and production of sugar from the Sorghum saccharatum within the U. S. in the present year; what inference may be drawn therefrom of its value as a source of this important article; and what is the composition, and saccharine per centage of the juice compared with that of the sugar cane.

Referred to Robert Battey, M. D., of Rome, Georgia.

22. What are the present sources of Senega, Spigelia and other prominent American roots, etc. as supplied by commerce?

Continued to Prof. C. B. Guthrie, of New York.

23. What is the actual state of the production of volatile oils in the United States, and more especially in Ohio, New York, and New Jersey, as regards quantity, quality and locality; together with remarks on the trade in volatile oils generally?

Referred to Edward S. Wayne, of Cincinnati.

24. What is the practical value of nitro-prusside of copper, iodine and other tests which have been proposed for detecting the adulterations of volatile oils?

Accepted by John M. Maisch, of Philadelphia.

25. Can arnica flowers be profitably cultivated in the United States?

Suggested by resolution of the Association to Henry A. Tilden, Esq., of New Lebanon, New York.

26. The Silphium laciniatum or resin weed of our western prairies yields a resinous exudation in appearance like mastic. What is the character of this resinous product, can it be substituted for mastic, and to what extent may it be collected as an article of commerce?

Accepted by Edwin O. Gale, of Chicago, Illinois.

27. What are the present sources of American Castor and the method of preparing it for commerce?

Accepted by T. R. Spence, of Detroit.

28. The subject of the professional intercourse between physicians and pharmacutists.

Accepted by Samuel M. Colcord, of Boston.

29. What are the actual sources of the light Cod-liver Oil of American commerce, both as relates to the species of fish that yield it, and the places where it is extracted? Is it adulterated with fish or sperm oil? and if so, is it done by the producers or collectors, or after it enters commerce?

Continued to Robert R. Kent, of Boston. (See page 492.)

30. What are the impediments, if any, to the extensive culture of the liquorice plant (*Glycyrrhiza glabra*) in this country; and what essays have been made towards its introduction?

Referred to Thomas P. James, of Philadelphia.

31. It is well known that many pharmacuetial preparations deteriorate by keeping: what are the most prominent instances of this kind of change; what are the best means of preventing or moderating them; and in cases of partial deterioration of valuable medicines, what is the best disposition to be made of them to avoid loss?

Accepted by Edward Parrish, of Philadelphia.

32. Are any of our native wines applicable for use in pharmacy as a menstruum; are these wines the subject of adulteration; and can the brandy derived from our native wine growers be properly substituted for the *Spiritus vini Gallici* of the Pharmacopœia?

Accepted by Frederick Stearns, of Detroit.

The Committee recommend that the Executive Committee be empowered to add to the above list of subjects in case they can get them accepted for investigation.

WILLIAM PROCTER, Jr.

EDWARD PARRISH.

On motion it was Resolved, That the Chairman of the Committees "On the Preliminary Revision of the Pharmacopœia," and on "Home Adulterations," shall have power to draw on the Treasurer for the expenses incident to their labors.

Oliver F. Gordon, of Cincinnati, was proposed and elected a member of the Association.

Henry F. Fish, of Connecticut, having been obliged to return home from indisposition, before he had communicated to the Association some remarks relative to lacs and varnishes; on motion, it was voted that he be authorized, if disposed, to send his communication to the Executive Committee for publication.

Theodore Metcalf, of Boston, proposed by the Boston delegation, and brought forward by the Executive Committee, was balloted for and elected to membership.

On motion of Edward Parrish, it was

Resolved, That the Executive Committee be authorized, after furnishing at least three copies of the Proceedings to each member, and distributing such number as they may deem best, to scientific Institutions, Editors, Libraries, &c., to hold the balance for sale at such price as shall cover the cost of publication and postage.

The Minutes were now read, the Roll called, and the Minutes approved, when, on motion, the Association adjourned to meet next year in accordance with previous resolution.

W. J. M. GORDON, *Secretary*.

REPORT ON SPIGELIA.

By R. H. STABLER, M. D.

To the American Pharmaceutical Association:

The subject entrusted to me at the meeting of last year being strictly an experimental one, I shall confine my remarks to a detail of the methods pursued in the investigation and the conclusions drawn from them.

Twelve ounces of spigelia root was macerated in two gallons of water for twenty-four hours and seven pints distilled off into a narrow necked receiver; numerous white flakes rose to the top and were carefully collected in the narrow portion of the neck, and separated from the remainder of the liquid for examination.

It had a pungent odor and taste, unctuous feel, was soluble in alcohol and ether; to water it communicates its sensible properties, but is only soluble in small quantities in that menstruum; has a granular appearance under the microscope; carbonate of potassa renders it soluble in water, but destroys its taste and odor. The decoction remaining in the still was separated by expression from the root, treated with solution of sub-acetate of lead to excess, filtered, and the excess of lead separated by carefully adding dilute sulphuric acid until it ceased to cause a precipitate; again filtered, the filtrate evaporated over a steam bath to the consistence of a soft extract. Ninety-five per cent. alcohol was made to dissolve all this residuum soluble in it, which left a tasteless brown extractive. The tincture was filtered off, passed through a bed of animal charcoal to decolorize it, evapor-

ated over a steam bath and treated with ether, which did not dissolve any portion of it. This substance has a reddish brown color, is uncrystallizable, neutral to test papers, deliquescent, and hence difficult to retain in the solid form, soluble in water and alcohol, insoluble in ether, and like the products of other members of the order Loganiaceæ, has an intensely bitter taste.

Carbonate of potassa or soda do not affect its sensible properties; solution of per-chloride of iron or sub-acetate of lead do not precipitate it from solution; infusion of galls appears to be incompatible with it, causing a precipitate when added.

When heated with liquor potassa and tested by muriatic acid, vapor evidence of the presence of nitrogen was afforded. It froths with water when shaken with it, and when taken internally causes vertigo and headache. Whether the vermifuge properties of the root reside exclusively in this principle, experiment only can determine, which has not yet been done for want of opportunity; that it has the active principle of the root in an eminent degree I am convinced by the experiments on my own person, producing the narcotic effects attributed to the plant.

Another portion of root in coarse powder was exhausted with hot water, the infusion expressed from the marc, the latter then treated by maceration in eighty per cent. alcohol and displaced with more of the same menstruum, until it passed without color; the alcohol was evaporated by a gentle heat, when a brown resin separated having neither taste or smell if purified from the bitter principle above mentioned, and is, I believe, inert.

A third portion of root, in coarse powder, was treated with ether by displacement until it ceased to extract color from it; this was exposed in a shallow dish and allowed to evaporate spontaneously; the extract left was exhausted with boiling water, filtered, and solution of per-chloride of iron added, which gave a bluish black precipitate. The portion not soluble in hot water was a soft wax which gave out a pungent odor when heated, owing to its being impregnated with the volatile oil of the root.

The constituents of the root according to this analysis are

1. A bitter, uncrystallizable, proximate principle.
2. A volatile oil.
3. Tannin.
4. Inert extractive.

5. Wax.
6. Inert resin.
7. Salts of soda, potassa and lime.
8. Lignin.

In answer to the questions proposed at the last meeting of the Association, in 1856, I would submit the following, as warranted by the above data.

1st. The activity of *Spigelia Marylandica* resides in an acrid, bitter, proximate principle, soluble in water and alcohol, insoluble in ether; it is not volatile, is uncrystallizable, neutral and deliquescent.

2nd. The volatile oil, to which the feeble odor of the root is believed to be due, exists in small quantity only, and does not appear to contribute essentially to its activity; this odor is strongest in the fresh root, and as all vegetable remedies deteriorate by exposure and age, the odor of the root is an indication of its freshness only, and as such valuable, but cannot be regarded as an invariable criterion of activity.

3rd. Water and alcohol are equally good solvents of the active principle.

4th. The carbonated alkalies do not diminish its activity.

From the Proceedings of the American Pharmaceutical Association, 1857.

REPORT ON NEW ENGLAND ISINGLASS.

BY CHARLES T. CARNEY, of Boston, Mass.

At the last meeting of this Association, in Baltimore, was committed to me for investigation the substance known in commerce as New England Isinglass, with a view of ascertaining where and by whom the article is prepared and its mode of manufacture.

I have the honor to submit herewith such information as I have been able to gather upon this subject, and, in addition, I venture some remarks upon other kinds of fish isinglass, and modes of manufacturing the same, believing it a subject worthy attention.

Ichthyocolla, from two Greek words, meaning fish and glue, is mentioned by both Dioscorides and Pliny; the latter of these writers ascribes its invention to Dædalus. It is obtained from

various fishes, some only of which have been hitherto ascertained. The finest kinds are obtained from various species of the *Acipenser*, but fish from other genera, viz., *Gadus*, *Morrhua* and others also yield it.

The organ from which the isinglass is usually procured is the air bag or swimming bladder, sometimes termed the "sound."

This is a membranous sac filled with air, (containing from 69 to 87 per cent. of oxygen) placed under the spine in the middle of the back, above the centre of gravity. In most fish this sack communicates with the œsophagus or stomach by the "ductus pneumaticus;" in others it is an imperforate sac, and occasionally there are two sacs which communicate with each other.

As long ago as the year 1772 the manufacture of isinglass from fish was considered of enough importance, by Mr. Humphrey Jackson, of England, to become the subject of careful study; failing in his endeavors to ascertain in England the process followed, he took a journey into Russia for the purpose of arriving at the true mode of manufacture.

In his paper, published in vol. lxiii. of *Phil. Transactions*, he says all authors who have hitherto described processes for making ichthyocola, have greatly mistaken both its constituent matters and preparation, and cites in support of this assertion the remarks of M. Pomet upon this subject.

The latter author says, as to the manner of making the isinglass: "The sinewy parts of the fish are boiled in water until all dissolve that will; the gluey liquor is strained and cooled; after cooling, the fatty portion is removed carefully from the surface, the liquor itself boiled down to a proper consistency and cooled, cut in pieces, twisted into crescent shape and carefully dried upon sticks.

From this we could reasonably infer that all fish containing gelatinous matter could be used with advantage for the manufacture of this article, but the inference would be an erroneous one.

The sounds or bladders of fresh water fish in general are preferred for making the best and most delicate isinglass, but the article known in commerce as "American" is made from the air vessels of salt water fish.

It is a matter worthy consideration whether we cannot furnish

from the sturgeon of our own rivers, isinglass that will equal that of Russia, which is derived from the sturgeon taken in the Caspian sea and rivers emptying into its basin.

The sounds or air vessels of the cod and hake bear great analogy with those of the *Acipenser* genus of Linnæus, and are in general so well known as to require no particular description.

Ichthyocolla is prepared in considerable quantities by the Newfoundland and Iceland fishermen. Their process is as follows : As soon as the fish is taken, they are split open, and the backbones, with the sounds attached, are thrown together in a heap ; but previous to incipient putrefaction the sounds are removed from the bone and salted for preservation. If the sounds are cut out from the back-bone, the intercostal parts are left behind ; these parts are the most valuable, and the Iceland fishermen are so sensible of this that they beat the bones upon blocks until the "pockets," as they term them, come out easily, thus preserving the sounds entire.

If the bladders are preserved with salt this must all be removed by "freshening" in water before they are prepared as isinglass. After being thoroughly freshened, they are scraped free from all adhering mucous, slit open, washed with lime water to remove all oleaginous matter, then rinsed in clean water, and dried upon nets in the sun.

I am indebted to the kindness of Jabez R. Gott, Esq., of Rockport, Mass., for most of the information and statistics relating to the manufacture of the article known as New England isinglass. Mr. Gott is the oldest, and, in fact, the only manufacturer of this article known to me.

As early as the year 1822, or thereabouts, his process was the subject of a patent in this country ; since that time experience has done much to simplify and improve the mode of manufacture.

I learn from him that the sounds or air vessels of the hake (*Gadus mertuuccius*) are generally used, those of the cod having the disadvantage alluded to in speaking of the Iceland fishery process.

The sounds are collected by parties residing upon the sea-coast of Cape Ann, and brought to Rockport for sale.

They are preserved by drying simply. After being taken from the fish, they are split open, cleansed from all membranous matter and dried upon cords or nets. It is preferable to dry them in this way rather than upon boards or sticks, as while the sounds are soft and wet, much of the gelatinous matter is absorbed by the latter substances, which decreases materially the value of the article for manufacturing.

After being again soaked in water until of a proper softness they are passed through rollers which knead them into a uniform pasty mass, resembling very much in appearance the dough of rye or Indian bread, and assume the form of a large, thick, homogeneous sheet.

This sheet is divided into strips, which are run through rollers again and again until reduced to the required thinness. These ribbon-like strips, after becoming thoroughly dry, are folded into bundles without much regard to the weight of each, and constitute the article, familiar to all in the trade, known as American Isinglass or Fish Glue.

The amount annually made is about 6,000 pounds, which is manufactured in the winter season, labor being at that time more available than in summer.

The amount yielded by each fish will average about two ounces, and this fact will suggest the number of fish laid under contribution for this article. The sounds are preserved during the warm weather simply by being thoroughly dried, and assume the hard, horny appearance of those herewith submitted, 1, 2, and 3, which are the sounds of the hake fish. I also submit specimens of the manufactured article. New England isinglass finds its way into commerce chiefly through the New York market.

In this connection I would remark that Mr. Gott has also prepared an article of isinglass from the air vessels of sturgeons captured in our southern rivers, but that it was not considered superior, by those who used it, to that made from the hake sounds. This may have depended upon the fact that the sturgeons were taken from warmer waters than those furnishing the Russian isinglass, and as, from my investigations, I am led to the conclusion, that the process of manufacture does not materially add to the quality of the product, but that the superior quality of the Russian isinglass pre-exists in the fish yielding it, if such

an expression is proper, I would again suggest the value of experimenting with the air vessels of sturgeon taken from some colder rivers of our country, with a view of equalling the product of Russia.

I was surprised to learn that the demand for New England isinglass was very limited, and unless some large increase in its consumption should occur, there appears to be no inducement for others to engage in its manufacture.

We find the preparation of this article, then, to be a very simple process; nothing more than certain membranous parts of fishes, divested of adhering mucus and dried in the air. The peculiar arrangement of the fibres of the article has doubtless attracted your attention, and this elongation is readily explained when the process of its manufacture is understood.

In speaking of the yield of isinglass from the sturgeon of Russia, the "*Acipenser huso*" of Linnæus, Mr. Jackson says, (in apparent opposition to the general impression, which is, that the sturgeon on account of its cartilaginous nature would yield great quantities of isinglass,) that no part of the fish except the inner coat of the sound, or air vessel, promised the least success; this being so full of "*rugæ*," adheres so firmly to the external membrane, which is useless, that the labor of separating supersedes the advantage.

The intestines, however, which in larger fish are several yards in length, being cleansed from their adhering mucus and dried, are found surprisingly strong and elastic, resembling cords made from the intestines of animals known as "*cat gut*," and promised to be of some practical utility.

The characteristics need scarcely be noticed here. The best is a whitish, dry, tough, semi-transparent substance, unchangeable in the air, of a leathery aspect and a mawkish taste, nearly insipid. When steeped in cold water it swells, softens and separates in membranous laminæ. At the boiling point it dissolves in water, forming when cooled a white jelly, which is semi-transparent, soluble in weak acids, but precipitated from its solution by alkalies. It is gelatin nearly pure, and if not brittle, like other glue, it is because of its elastic texture.

The uses of isinglass are various and important. The principal consumption is for "*fining*" liquors, beer, wine, &c.; and

it is noticed that during the conversion of isinglass into fining, the acidity of the menstruum seems greatly diminished, at least in taste; probably not on account of any alkaline property of the isinglass, but by its enveloping the acid particles.

As an article of food in the preparation of creams and jellies it is in great request. Four parts of it convert one hundred of water into a tremulous jelly.

It is used with gum as a dressing for silks and ribbons. The makers of artificial pearls employ it to fix the "Essence d'Orient" on the glass globules which form those pearls.

It is used, also, dissolved with gum ammoniac, as a cement, for joining broken china, &c. By spreading its solution upon silk the well known court plaster is made. Sheets of wire gauze, set in window or lamp frames and dipped several times in a solution of isinglass, answer instead of glass for some purposes. The outer surface should be varnished to protect it from damp air. This application was made by M. Rothen, of France, and these panes of gelatin are now much used for lamps instead of horn, in the maritime arsenals of France.

UPON IMPROVEMENTS ON METHODS OF RENDERING MEDICINAL PREPARATIONS, PLEASING TO THE EYE AND TO THE TASTE, AND AGREEABLE TO USE.

By FREDERICK STEARNS, of Detroit, Mich.

Next to efforts in the advancement of pharmaceutical skill and science, which secure increased efficiency to medical agents, there are none which meet the more ready appreciation of the physician, or insure the grateful remembrance of the suffering invalid, like those which tend to relieve the remedies employed of all repulsiveness in form, appearance, or taste.

While I am unable, from my own knowledge, to offer as much of value to the Association as could older and more experienced members, yet I submit the following *random* notes, and express the hope that some more skilful pharmacist will be appointed to report upon the same subject at our next meeting.

The administration of the officinal vinegars and dilute mineral acids, is rendered more agreeable by the addition of small portions of alcoholic solutions of any of the flavoring essential oils,

lemon, wintergreen, pimento, Ceylon cinnamon, etc., or of spices; sugar, when not contra-indicated, is also an allowable adjuvant.

The popularity of the elixir of vitriol over the dilute acid is owing to its agreeability to the taste; dilute phosphoric acid should have added to it a solution of the essential oil of the sweet orange.

Comp. tinct. cardamom, concent. infus. of rose, are excellent additions to medicated acids or vinegar, covering a portion of their taste, and imparting an agreeable color.

Prussic acid is best given in syrup of marshmallow. Lactic acid, which is now coming into use as a remedy for dyspepsia, indigestion, etc., is made into an agreeable drink with water, sugar and essence of lemon; it is also eligibly exhibited in the form of a pastill, in which form, also, the oxalic, tartaric, tannic and citric acids are most available.

Inert powders, or those which are comparatively so, it is said, can be made to produce a medicinal effect much quicker by long trituration with sugar of milk; in the case of ipecacuanha or of opium, this effect is rendered much greater; long trituration of calomel with the same substance, renders minute doses of it equal, in rapid and permanent effect, to quite large ones of the drug administered in the ordinary way.

Tasteless powders should be administered with aromatics, the milder spices, Ceylon cinnamon and the like; astringent powders can in this way be rendered less unpleasant.

Cane sugar, well dried and reduced to the finest possible state of division, by long trituration in a mortar, is an elegant vehicle in which to administer the alkaloids, and their salts, quinia, morphia, etc.; the *modus operandi* is as follows: instead of triturating the medicine and sugar together, mix the dose in its crystalline state, (without breaking it up,) by means of a spatula on a piece of paper, with a sufficient portion of the sugar previously powdered. In this way each crystal becomes enveloped with a dust of saccharine powder, and when placed upon the tongue and washed down with a draught of water, leaves nothing upon it but the sweet impression of the quickly dissolved sugar.

Mr. Maisch recommends the administration of the saline powders, ammonia salts, iron salts, potassa salts, etc., in effervescing

draughts, by which their bitterness or pungency is in a great measure overcome. Those pharmacutists who furnish "mineral" or carbonic acid water, possess the means of administering many similar substances, in an agreeable manner ; a "Seidlitz" is in this way administered without the necessity of giving an extra dose of tartrate of soda.

By an improvement in the processes of capsulation, the most volatile substances, ether, chloroform, turpentine, are now best administered in capsules of gluten ; these are imported from France, and the "*Perles d'Ether*" of M. Clertan are certainly among the most beautiful and finished of the pharmaceutical productions of our accomplished co-workers, the French pharmaciens. Each capsule contains about five minims of ether, the empty capsule weighing but about two grains.

There is no reason why our list of officinal syrups should not be greatly extended, from the fact that sugar is an excellent preservative of the medicinal virtue of plants, proper regard being paid to the separation of the inert matters which excite fermentation ; its agreeability as an excipient renders it grateful to the invalid ; the cloying effect of syrups can be counteracted by the addition, at the time of using them, of some pleasant vegetable acid or acid syrup.

Many of the non-officinal fluid extracts, now so popular, could be converted into concentrated syrups by replacing part of the hydro-alcoholic menstruum with sugar.

I have in this way prepared, successfully, syrups of blackberry root, ergot, buchu, blood root, black cohosh, capsicum, cranesbill, dandelion, golden seal, hyoscyamus, horehound, lobelia, sculcap, yellow dock, etc.

Unless alcohol is desirable in fluid extracts, from a therapeutical point of view, it seems to me obvious that sugar could with advantage replace alcohol in nearly all the non-officinal fluid extracts, concentrated tinctures, etc., intended for internal use. A syrup of lime has been introduced as a substitute for lime water, it being a much more concentrated form of lime solution.

The phosphates are most eligibly exhibited in the form of syrups, particularly the phosphate of lime ; a syrup composed of a solution in phosphoric and muriatic acids of the phosphates of soda, potassa, lime and iron with sugar, and pleasant flavoring,

has come into general use, I believe, in some of the Eastern cities, particularly Philadelphia; it is used in consumption and dyspepsia, and from its elegant appearance and pleasant taste seems to be an eligible preparation.

A tincture formed by macerating the bark of *Prunus virginiana* in rum, is an agreeable addition in the way of flavor to our officinal concentrated syrup of sarsaparilla. The U. S. syrup of *Prunus virginiana* I have found to be one of the most delightful of adjuvants to cough mixtures; it is also an elegant vehicle for the administration of the most powerful anodynes, etc., used in pulmonary complaints; prussic acid only serves to give increased flavor of the cherry to this syrup when given in it.

I have found a syrup of roasted coffee excellent in covering the taste of quinia, morphia, etc. An infusion of roasted coffee is valuable in covering the taste of Epsom salts, senna, and of many bitter infusions.

In many extemporaneous mixtures, a syrup prepared from the essential oil and peel of the sweet orange, is agreeable as an adjuvant.

If pharmacutists would generally prepare their syrup of ginger and tolu after the method of Mr. Finley, as published in the 23d vol. of the American Journal of Pharmacy, I think they would not have cause to regret the change from the turbid, inelegant ones of the U. S. P., to the beautifully transparent and strong ones prepared by his method.

Strong fruit syrups, prepared by dissolving with as little heat as possible, 2 lbs. troy of refined sugar in the expressed juice of any fruit or berry, make delightful adjuvants to numberless extemporaneous prescriptions of the physician; they are agreeable additions to effervescent draughts, and are best for flavoring mineral water syrups.

Syrups of Iceland moss, Irish moss, marsh-mallow, horehound, acacia, liquorice, liverwort, etc., are favorites in certain localities as cough remedies; infusions of the same with gum and sugar are formed into pastes, similar to jujube, and meet with ready sale.

Confections, though considered in their ordinary forms as agreeable methods by which to administer medicines, are improved by introducing the proper dose of any one of them into figs or dates, and prunes freed from their stones.

Jellies of raspberry, current, quince, blackberry, etc., are nice for disguising the taste of powders when given to children. A little jam or jelly very nicely covers a bitter pill, for those who have a peculiar aversion to swallowing them.

Among the multitude of purposes for which pure glycerin is becoming available, its use as a solvent and preservative in pharmaceutical manipulations is most important; there seems to be scarcely a fraction as yet developed of the uses to which this wonderful substance can be applied in pharmacy.

Its solvent power, in most cases, equals that of alcohol or water, being sometimes even greater.

By mixing it with alcoholic or aqueous solutions, which are liable to change, they are thereby rendered permanent. Solutions of vegetable matter in it do not change or ferment.

It does not itself become rancid, and from its viscosity it can be used instead of cerate or oil as a vehicle for many substances used in embrocations.

The disagreeable sulphurets are soluble in it, and their solutions are among the most available methods of administering them; iodine and its salts, are dissolved by it.

Liq. iod. iron, syr. iod. iron and manganese, syr. iod. zinc, prepared with glycerin are recommended as elegant and eligible.

Escharotics of the deliquescent kinds are rendered particularly available in solution in glycerin, their action is much more controllable, and as the glycerin does not dry, their action is more persistent. The terchloride of antimony (cryst.) iodide and chloride of zinc, nitrate of mercury, chromic acid, etc., are among those suitable to use in glycerin. It forms solutions of the deliquescent salts, of the sulphate of potassa and soda, of the alkaline chlorides, and even of oxide of lead.

The salts of the vegetable alkaloids can be exhibited, dissolved in this substance, as embrocations or otherwise. It will dissolve bin-iodide of mercury in sufficient quantity, so that $\frac{1}{2}$ teaspoonful will contain a sufficient dose. It is useful in emulsions, of copaiba and of oils; it aids in covering the taste of the nauseous ingredients.

It is suggested to use glycerin on account of its superior solvent power over fat or oil in the extraction of the active matters of the leaves of savin, stramonium, cicuta, dulcamara, elder, to-

bacco, etc., in place of the cerates as now prepared from these plants. It is superior to oil in imparting flexibility to collodion. Its preservative power is available for the preservation of vaccine lymph, the recent dry scales of which can be dissolved in it and kept unchanged for a length of time.

It is proposed that it be substituted for sugar in some of those medicinal syrups which are so liable to ferment. The properties attributed to it as a fattener would give additional value to it as a vehicle for ague remedies, as in syr. ipecac., syr. scillæ comp. Its bland and soothing properties when applied to the skin in an irritated or inflamed state, have caused it to be much used therefor. And I have seen numerous creams, balsams, lotions, etc., prepared from it by various pharmacutists, many of which exhibit skill and taste.

The lozenge or pastill has become so common a form in which to exhibit medicinal substances, powders, extracts, juices, essential oils, etc., that I shall notice herein only the following: the efficiency of santonin as an anthelmintic has given rise to its extensive employment in the form of a bonbon or lozenge, delicately flavored, and rose colored; it forms in this shape by far the best and most eligible. "worm lozenge" extant.

The preparation termed "Lactinates" find some favor among medical men; they are simply saturated tinctures of any medical plant, inspissated upon cane sugar, or sugar of milk. The applicability of this process depends upon the active principle of the plant not being decomposed by the necessary heat employed in preparing them. I have prepared lactinates of sanguinaria, ipecacuanha, hyoscyamus, digitalis, which possessed perfectly the characteristic odors and properties of those medicines.

Homœopathic globules are made of flour and cane sugar, not of milk sugar, and why can we not learn from the infinitesimal dose-givers something? These pellets (the largest of those they use weighs $\frac{1}{4}$ of a grain) could be made of any size, and when medicated by means of concentrated alcoholic solutions of the more powerful alkaloids, would prove a very agreeable method of administering them.

The usual methods of rendering pills less repulsive by means of coating them with gelatin, gold or silver foil, dried mucilage of linseed, seems to be far superseded by the new and elegant

method introduced by French pharmacutists, by which they are covered with gluten and sugar. *Odor* and taste are destroyed by converting them into bonbons. By this new method the odor of assafetida is entirely covered, and the most bitter dose rendered palatable. Extracts, all of the officinal pills and others, several decomposable salts, many of the alkaloids, cubebs, copaiba, astringents, etc. etc., are prepared in this form. Those I have seen are from the house of Garner, Lamoreaux & Co., Paris, and are striking evidences of the superior skill of the French pharmaciens.

The preparation of an unalterable pill of iodide of iron after the formula of Blanchard, pharmacien of Paris, has attracted considerable attention. I have prepared these pills for nearly two years, and they have become very popular among my medical friends. I now substitute an ethereal solution of mastic for one of tolu, with advantage in coating the pills as it dries quicker; the varnished pills are not apt to adhere, and the medicinal effect of the mastic aids that of the iron.

A pill or bonbon of oxidized balsam copaiva under the title of "Copahine Mege," has found much favor lately with physicians. They have the appearance and taste of sugar plums, and consist of copaiba (which has been heated in contact with nitric acid) covered with sugar, colored and flavored. They agree well with the stomach, and seem to produce the curative effects of the copaiba quicker than when it is given by the ordinary methods.

Lycopodium, which costs but a very little more than the best powdered liquorice root, is to my mind much more elegant to use for keeping pills from adhering to each other, than any other powder. Powdered althea root is also used for this purpose.

French Pharmaciens who exhibit the greatest skill and improvements in that department of pharmacy of which this paper treats, have brought the process of capsulation almost to perfection, as exemplified by the manufactures of Raquin, Clertan and Mathey Caylus, in which copaiba alone, or its various compounds with cubebs, with astringents, etc., the turpentine, ether, essential oils, and numerous other substances, are enveloped in a thin, tasteless and inodorous covering of the gluten of rye flour, of a size favorable to easy deglutition, and yet containing a sufficient dose of each. The filling of them is so perfect

that they contain no air bubbles, and the empty capsules weigh only from $1\frac{1}{2}$ to $2\frac{1}{2}$ grains, whereas the gelatin capsule weighs nearer 10 grains.

The empty capsule, another French idea, although now made largely in this country, consists of two short, thin cylinders of gelatin, closed at one end, and sliding one over the other at their open ends. These are made of several sizes, and all that is required in order to use them is to fill the smaller cylinder with the medicine, whether solid or liquid, place the other over it, and having allowed it to soften in the saliva, it is as easily swallowed as a morsel of bread.

The tasteless French wafer is another method of taking powders; they are made white and tasteless, diameter about $3\frac{1}{2}$ inches, and are used by moistening the edges of the wafer with saliva, placing the powder in the center; and folding the edges over the center thus enveloped, the medicine is taken without being tasted.

Numberless methods are proposed for covering the taste of cod liver oil, none of which are so simple and free from objections as that of chewing some bitter substance, as orange peel, previous to taking the dose. Emulsions of cod liver oil are elegantly prepared by means of carbonate of potassa, orange flower water and syrup. Many physicians prescribe cod liver oil in brandy, which tends to cover its taste and aids its medicinal action.

Castor oil is not improved in medicinal action by most of the methods used to disguise it, and the method of giving it floating between spirit and water is doubtless the best, which is as follows: in a proper cup place an ounce or two of mint water, milk or cold infusion of coffee, and having thoroughly wet the sides of the cup with it, pour the dose of oil carefully into the center of it, pour upon this a little brandy or any agreeable alcoholic tincture; the oil thus prepared can be swallowed without its touching the mouth at all, being completely enveloped by its aqueous and alcoholic vehicle. The essential oil of spearmint possesses the power of covering the taste of copaiba, in emulsions of that substance, in a remarkable degree.

Since fluid extracts were made officinal by the last revision of the United States Pharmacopœia, the number of plants which

have been found eligible when used in that form has greatly increased. Messrs. Tilden & Co. now prepare over one hundred varieties of fluid extracts; they have the advantage of being concentrated fluid representations of plants with but little alcohol; and in very many of those now preserved by means of alcohol, sugar might with advantage be substituted for that purpose.

Among the non-official fluid extracts, those of arnica, blackberry, cranesbill, ginger, buchu, dandelion, dandelion and senna, hyoscyamus, and sarsaparilla compound, I consider especially eligible, and there is no doubt but that there are many other plants which experience will prove to be most valuable in the form of fluid extract.

I have had occasion to prepare, during the past year, several *saturated* tinctures, as some physicians think them less variable, and require much smaller doses. In preparing them I have used a considerable excess of the dried material over and above the amount calculated that the menstruum can exhaust. This method is wasteful, and is only applicable to local prescribing, and when the effects of such preparation can be closely watched.

I have prepared as above, saturated tinctures of bloodroot, belladonna, henbane, lobelia, digitalis, conium, etc.

The compound tincture of cardamom is one of the most elegant of adjuvants to mixtures of tinctures, etc., known.

Most pharmacutists color their essences or alcoholic solutions of the essential oils of peppermint, spearmint, pennyroyal, and the like, by means of curcuma. Now by placing a small portion of the dried plant, from which the essential oil is obtained, into the solution of oil previous to filtration, a color is obtained which is much more natural. A few red rose leaves impart to essence of winter-green a more delicate color than saunders or cochineal.

The infusion of rose leaves forms a judicious addition to many extemporaneous mixtures, owing to its power of disguising taste, and to its beautiful color.

The modern idea of preparing extemporaneously, and taking infusion of quassia, by drinking water from goblets made of quassia wood, has already become obsolete.

In the preparation of cinnamon water, the essential oil of the

true or Ceylon cinnamon should always be used, as it produces a medicated water of delightful flavor and agreeable odor.

Of late years the ligneous portion of slippery elm bark, which is separated when this bark is ground from the mucilaginous portion by bolting, has been used much for cataplasms in place of linseed meal, bread, etc.; it is cleanly and sweet. There is an article call spongio piline, imported from England, made of a mixture of wool and sponge attached to a thin, but strong sheet of rubber. It is used by simply wetting a piece, cut to the size wanted, with water (warm or cold); the impervious rubber keeps the moisture from evaporating. Infusion of tobacco, belladonna, or any anodyne or narcotic, can by means of this substance be eligibly applied externally.

Ointments when prepared extemporaneously upon prescriptions, should have used in them as a vehicle for the action of remedies, only the sweetest of lard or suet, or else use perfumes to cover any disagreeable odor it may possess. A cerate of wax and oil, the unguentum aqua rosæ and glycerin cerate, are eligible vehicles for powerful substances exhibited in ointment. These should be prepared of various degrees of hardness, so as to correspond with the prepared lard, spermaceti and simple cerate of the United States Pharmacopœia.

Cantharidin tissue, blistering taffeta, cantharidal collodion, solution of cantharidin in oil, solution of cantharidin and pure gutta percha in chloroform—all these form new and popular substitutes for the ordinary blistering cerate.

I have been in the habit of preparing for some medical friends an embrocation which is used for piles in place of the nutgall ointment of the Pharmacopœia, prepared by dissolving *one half* drachm of hyd. alc. extract of tobacco and *one half* drachm of tannin in *two fluid ounces* of glycerin.

Hat Case—a sort of oil cloth—forms a useful article in spreading plasters; it is very flexible, accommodating itself to any inequalities of surface, and does not allow the material spread upon it to penetrate its substance so as to show upon the reverse side.

It seems singular that Vallet's mass of proto-carb. iron should not be more generally employed in place of many other more expensive and less eligible forms in which iron is exhibited; its

pleasant taste, ready acceptability to the stomach, and efficiency even in small doses, its easy preparation, all render it valuable to the physician and profitable to the pharmacist, and yet there are but comparatively few pharmacutists who prepare it at all.

Lactate of iron is, perhaps, best exhibited in the lozenge form. I have noticed an elegant pastill of lactate of iron of French make, which are sold by importers.

The oil or butter of the cocoa nut is an elegant vehicle for the preparation of ointments, on account of its snow white color and agreeable odor. It is less liable to become rancid.

The butter of cacao, or the chocolate nut, is used sometimes for enveloping pills; also for making suppositories.

Although there seems to be much difference of opinion among English pharmacutists concerning the value of *concentrated* infusions, as compared with those prepared by the officinal methods, there is one thing certain, that from the ease with which the concentrated ones are kept, in spite of their not becoming officinal, they will be thus prepared and kept by most pharmacutists.

Of all saline aperients and cathartics the solution of citrate of magnesia seems to have reached the popularity due to it as the most agreeable ever invented. Its use is yet somewhat confined to the larger towns and cities. Though from the improvements made in its preparation, so that it is permanent, it can be kept any length of time and easily transported to any part of the country.

A dry and soluble citrate of magnesia prepared after the method of Robiquet and mixed with flavored sugar, bi-carb. soda and citric acid, forms a portable and exceedingly pleasant aperient salt for travellers to carry.

The French put the soluble citrate of magnesia up into pastills, each of which contains one gramme of the salt.

The fluid magnesia of Sir James Murray is easily prepared by any pharmacist possessed of an apparatus for making mineral water. This bi-carbonate is an eligible ant-acid, much used by the English; it is aperient in large doses, its cathartic effect being enhanced by drinking it with a portion of syrup of citric acid, by which a portion of the bi-carbonate is converted into

citrate of magnesia with the escape of abundance of carbonic acid gas; it is drank while effervescing. The fluid magnesia is recommended as a vehicle for bitter infusions, covering their taste, etc. It forms an elegant ant-acid and stomachic cordial for infants—used to prevent their food from turning sour upon their stomachs, and as a gentle carminative in place of solutions of opium—when prepared by adding to it a small proportion of the essential oil of anise, caraway and fennel dissolved in alcohol, water and sugar.

The French administer sulphur internally in the form of a pastill, each of which contains 10 grains of sublimed sulphur.

As phosphorus readily dissolves in glycerin, this solvent is recommended as a fit substance in which to exhibit it.

The principle objection to the valerianates—their odor—may be overcome by using with them almost any highly flavored essential oil. Oil of gaultheria succeeds well among others.

Numerous other ideas suggest themselves to me illustrative of the subject matter of this article, but the amount written warns me to close; and, in conclusion, I would remark, that every pharmacist possesses within himself the ability to add a mite or more to the general knowledge of our profession, and that it is his duty to impart that knowledge for the benefit of the whole, and while it seems evident that but a small portion of the inherent skill and taste of the *American* is exhibited in perfecting the agreeability of our pharmaceutical preparations, yet, as progress in this department of our art is daily being made, we may reasonably hope, at no distant day, to successfully rival the productions of other arts and professions in beauty and attractiveness.

From the Proceedings of the American Pharmaceutical Association—1857.

ON THE MANUFACTURE OF IODINE FROM THE ASHES OF SEA-WEEDS.

By THOMAS B. PORTEUS, of Boston.

As this paper is submitted with the essentially practical purpose of assisting those who may at some future time attempt the manufacture of Iodine in the United States, and of putting them in full possession of all the details necessary to a successful result, the author deems it proper to take a passing glance at

the present state of the trade in Europe, so as to place before the reader a correct idea of the extent and sources of the production of this important article of the Pharmacopœia.

The principal seat of the manufacture is the city of Glasgow, Scotland, in which city and neighborhood there were engaged in the manufacture, in 1854, nine separate establishments, consuming on the average from 800 to 2000 tons of kelp annually. Beside these, there were two in Ireland, located at the head of Loch Swilly, as being conveniently situated in the centre of the kelp district. There are also two establishments in France, both carried on by Mons. Corneille; one at Brest, the other at Cherbourg; so that in Europe there are about thirteen houses in all, exclusively engaged in supplying the world with the article of Iodine.

It is scarcely necessary to say that the only known source of iodine, commercially speaking, is the marine plants which grow spontaneously along all the northern coasts of Europe. Of the modes adopted in converting these into kelp, as the incinerated plants are called, we will have occasion to speak more fully in another part. Our present object is to give a correct estimate of the amount of kelp consumed annually, and the quantity of resulting products.

The quantity of kelp imported into Glasgow is generally about 6000 tons annually; it has, however, in some years amounted to between ten and twelve thousand; the sum first mentioned being a fair average. The quantities used in the manufacture in Scotland and Ireland may be safely set down as follows:

Scotland,	{	Glasgow, . . .	6000 tons.
		Borrowstoness, . .	2000 “
Ireland,	.	. . . . .	1000 “
Total			9000 “

Of this amount, 7000 tons are produced in Ireland, and the rest in Scotland; the price on the average, at the various places of collection, is \$20 per ton; the cost to the manufacturer of iodine, including freight and commission to the local buyers, is \$25; these are the average; some kelps bringing as high as \$40, this of course depending on quality. We have, then, say 9000 tons of kelp at \$25, amounting to \$225,000 yearly, expended

in the purchase of this product of the ocean, which, but for the iodine manufacture, would assuredly go to waste, as in addition to what is made into kelp, they also get what they require for manure. Of this sum of \$225,000, \$175,000 is distributed along a coast in Ireland not exceeding two hundred miles in extent; and mostly indeed within the limits of one county, viz.: Donegal. Are these facts not worthy the attention of the seashoard inhabitants of Maine and Nova Scotia? Undoubtedly the time must come when the manufacture of kelp for chemical purposes will be one of the branches of trade on the American Continent; when it may be we cannot presume to say, but the initiative must be taken by the coast people, and we have no fear, if they produce a good article, but that the enterprise of Boston merchants would soon find means of turning it to profitable account.

The amount of iodine procurable from kelp has been variously stated, but is generally set down at about 10 lbs. to the ton. This amount would be too high an average for the article imported into Glasgow, as the adulteration of it, especially on the Irish coast, is carried on to an enormous extent, as much as thirty per cent. of stones and gravel being generally introduced during the process of burning; on the other hand, the writer of this has known kelp from some particular districts to yield 15 lbs. per ton for a series of years, and some as high as 20 lbs. to the ton. If we take them at an average of 9 lbs. of iodine per ton, we will be pretty near the real amount.

But iodine is not the only valuable product of the manufacture; if it were so, it would never pay.

The "salts of potash" form a very important item in the manufacturer's calculation of profits; and in the properly separating these from their mixed solution in the kelp ley, consists the whole nicety of the process. The proper mode of doing this has been completely omitted in all works treating on this manufacture which we have seen, so that any person attempting the manufacture of iodine, trusting to the loose and careless phraseology of the books, would be groping in the dark; the result being inevitable failure. To obviate this, and place everything plainly before him, as briefly and with as few technicalities as possible, is the object of this paper.

To resume our estimate of products, the following tabular view will render it more clearly :

9000 ton	9 lbs. iodine per ton,	81,000 pounds.
kelp	500 lbs. chl. of pot. per ton,	4,500,000 "
yielding,	150 lbs. sulph. of potash per ton,	1,250,000 "
	300 lbs. mixed carbonate, muri- ate and sulphate of soda, called by the trade kelp salt,	2,700,000 "

This shows upwards of 2,600 tons of salts of potash introduced into the British market annually, incident to the manufacture of iodine. These are almost wholly consumed by the alum makers, and sell generally at about \$50 per ton. From the cheapness of soda in Britain, the mixed carbonate and sulphate of that salt are difficult of sale, seldom bringing more than \$6 per ton; but in the United States they might be wholly used up to advantage in the soap manufacture, all the soda salts used for that purpose being imported.

The insoluble residuum which remains after the exhaustion of the soluble contents of the kelp, and which amounts to about one half the original weight, when mixed with sand, is the universal flux used by the glass bottle makers in Scotland. The price generally paid is \$1 per ton; the trade name for this residuum, which is a mixed silicate of soda and potash with various impurities, is kelp waste.

This then exhausts the number and quantities of the products incident to the manufacture of iodine from the incinerated ashes of sea weed, so that if we calculate the two French establishments to be equal to two medium Scotch in their consumption and product, the following table will be a very near approximation to the annual products and money value of the trade :

Products of Iodine.

Scotland and Ireland,	81,000 lbs.		
France, . . .	19,000 lbs.	100,000 lbs.	\$3.00 \$300,000

Chloride and Sulphate of Potash.

Scotland and Ireland,	2,600 tons.		
France, . . .	500 "	3,100 tons.	\$50 per ton. 155,000

Soda Salts.

Scotland and Ireland,	1,350 tons.		
France, . . .	300 "	1,650 tons.	\$6.00 per ton. 9,900

Kelp Waste.

Scotland and Ireland;	4,000 tons.			
France,	1,000 "	5000 tons.	\$1.00 per ton.	5,000
				<hr/> \$469,900

Four hundred sixty nine thousand nine hundred dollars. And this large sum, the result of a trade in an article discovered only in 1812, and not yet in anything like general use as a remedial agent more than a single generation; one of the many inestimable boons presented to suffering humanity in the progress of chemical science.

We now proceed to consider the modes adopted for the manufacture of iodine from kelp; and first in order as being the most important in view of the object of this paper, is

The preparation of the Raw Material or Kelp.

All the *deep sea plants* are more or less rich in iodine in contradistinction to those which grow above low-water mark; as a general rule those sea plants which are fully exposed to the action of the sun and air by recession of the tide, are unfit for the preparation of kelp for iodine making; they are characterized by being possessed, in a greater degree, of salts of soda than those which draw their sustenance entirely from the ocean, these latter being extremely rich in potash salts and iodine as compared with the former, but varying in this respect considerably from each other. To those, then, who may essay the production of the most profitable kelp for the iodine manufacture, we would say, in a word, reject all those plants which may be procured by cutting them from the rocks at low water, as not worth the trouble and expense of preparing, and trust to the mixed kinds of deep sea plants which are abundantly thrown up on the beaches, after the storms have torn them from the submerged rocks. The best kind of sea plant for the purpose is the tangle, or *Palmata digitata*, or lieach, as the Irish call it. This is a plant growing from one long thick stalk, with branches about three inches in breadth, with a smooth and leather-like appearance, very greasy and slimy to the touch; when cast ashore in heaps it has a greenish yellow tinge. Wherever this is plentiful, a rich kelp is easily prepared.

Of course it is not to be supposed that anything like picking the kinds of kelp to be burned is practicable; the only object of these remarks is to indicate the general quality of the weed, so that beaches where these are not abundantly thrown up may be avoided, and districts where they are plentiful searched for and preferred. The quantity of weed required to make one ton of kelp may be safely set down at from twenty-five to thirty tons in its wet state, so that all kinds which may be cast ashore are of course indiscriminately mixed up in collecting; the quality of the article being determined by the general abundance of the said long tailed weeds.

Upon the weed being cast ashore by the surf, it is to be carted on to the most convenient spread field, which may be either the stony beach or rocks, or green sward. There it is to be spread out by means of pitch-forks in a moderately thin layer, and if the weather is warm and drying, it may be turned once or twice somewhat as hay is prepared, during drying, which will take four to five days, according to the weather; it shrinks considerably. When dry enough for burning, it is crisp and easily crushed in the hand. It is now to be collected into one or two large heaps in a convenient place for burning, which is done in a rudely made kiln, formed by the stones on the beach; the kiln should be about eight feet long by two and a half feet wide, and two feet deep. A flat rock is generally chosen for the bottom, or a shallow hole, dry, lined with stones on the bottom, and the sides made with loose stones, built like a dry well, and turf laid outside with air holes to regulate the draft. A fire of wood is now kindled in the kiln and the dried weed gradually put on until the fire is fairly set agoing; the weed is now assiduously added all over the kiln, wherever the flame burns out, and this is continued until the whole weed is burned, or as long as the workman thinks necessary to continue. When about to stop, the fire is allowed to slack down, and the red mass of ashes are to be diligently stirred by two men, one at each end of the kiln, with an iron rake, until the mass becomes pasty, when the process is finished. If there is room, more weed may be burned in the same kiln by kindling a fire on top of the kelp and proceeding as before. The kelp, when cold, is to be taken up and housed for market.

The separation of the soluble contents of the Kelp.

The kelp is to be broken up by hammers into pieces of the size of egg coal; these are introduced into the steepes, which are square cast iron tanks about six feet long, four wide and four deep, with a faucet in the side at the bottom, to run off the ley; a rude filter of straw and cinders is placed over the aperture on the inside to prevent the fine dust from coming through with the ley. The steepes having been filled with the broken kelp, cold water is run on a few of them, the number depending on the size of the establishment, the rest are not watered; after standing eight or ten hours the water is strongly enough charged, the faucets are opened and the clear ley run into a cistern below; from this cistern it is pumped into the large cast iron evaporating vessels. Of its concentration there we will have occasion to speak hereafter. In the mean time the vessels which have been emptied are again filled, but this time hot water is used to expedite the solution; this after standing a night is to be run off and pumped into those steepes which had been left unwatered, there to take up from the fresh kelp a sufficiency of salts to make the ley strong enough to be pumped into the evaporating pans, thus saving fuel. In this way in a well regulated work the liquor of the steepes No. 1 are run on to No. 2, and these as they become spent are run on to No. 3, thus keeping up the supply of strong ley for the boilers; this is a most important point in the economy of an iodine work. No. 1 being exhausted, is again to be filled and covered with weak ley from the others, and so on in rotation.

Of the Boiling.

And first of the Hydrometers. The Hydrometers used are those known as Twaddle's, and are three in number. No. 1 is graduated on the scale of water, as 0° at the top in degrees, and numbered at every second degree, as 2, 4, 6, 8 and so on to 24° . The use of No. 1 is to show the strength of the ley in the steepes when getting weak, and when the glass sinks to 2° the steep may be emptied. These are useful and simple instruments, and very easily understood by the workman. The ley from the steepes should, if possible, never be put into the boilers at less than 36° or 40° , if attainable, as this will obviate the necessity

of evaporating a large quantity of useless water, and consequently save expense.

In regard to the separation of the mixed salts. They are taken out in the order of their insolubility, sulphate of potash being the first parted with by the ley, as it contracts in the evaporation. There are two methods of obtaining this salt; that which is adopted depending upon whether the operator wishes to crystallize out the salt, or merely to deposit it during the boiling; if the crystals are wanted, the ley from the steeps should not exceed 30° on the hydrometer, and should be boiled until it shows a pellicle on the surface, when a little should be taken out and blown upon by breath; this will occur when it marks on the hydrometer 42° to 44° . The fire should now be drawn out, and the hot ley ladled into the crystallizing pans, which are best made of cast iron; when cold, a layer of the salt will be found adhering to the sides of the vessel; this should be allowed to remain after the liquor is removed, and five or six different panfuls allowed to crystallize, one after the other, when the salt may be removed to make room for another quantity. This plan is, however, now seldom adopted, as it entails a loss of time in the cooling, and takes up too many vessels.

The other plan is this: the ley at 36° or 40° is evaporated up to 62° or 64° at one boiling. When it reaches 44° it then begins to part with the sulphate of potash, which falls down to the bottom of the pan, in small scaly crystals, of a grey color; as these are apt to adhere to the sides of the pan, a scraper of iron, tipped with steel, is used to keep the sides free, and prevent caking, as this would endanger the safety of the vessel. The scraper is an iron rod about 6 feet in length, with the lower end broadened out to about 3 inches in width, and kept sharp. The salt, as it is scraped down and deposited, is scooped out with a long wooden-handled iron shovel, perforated with small holes to allow the water to drain off; a half cask with a few holes for drainage is placed with its edge over the side of the pan to receive the wet salt; this allows the liquor to drain back into the boiler. After the boiling has continued until a strong pellicle is formed on the ley, which will occur at 62° or 64° , the fire should be withdrawn, and after standing 20 minutes or so, the contents ladled into the coolers. A further deposit of sulphate will be

found in the boilers ; this is, of course, added to the rest in the cask and allowed to drain.

The liquor being now deprived of its sulphate of potash, will, upon cooling, deposit a plentiful crop of white crystals of chloride of potassium all round the sides and bottom. This liquor, when cold, must now be ladled into the boilers again for further evaporation ; the bottom of the cooler, from which it has been taken, cleaned out and put into tubs with small holes in the bottom to drain the salt, the liquor being preserved and added to that in the boiler ; the crystals on the sides will drain down to the bottom in a few hours, and then may be removed, mixed with the dried bottoms and sent to market.

The liquor from which these crystals were obtained, and which was returned again to the boilers, is now to be evaporated as before ; this time the boiling is to continue until the hydrometer marks 66° or 68° ; and during this boiling the soda salts begin to be deposited in the same manner as the sulphate was in the first. The pan must be diligently scraped and the salt put into a tub, and set to drain over the edge of the pan as before, keeping this deposit and the sulphate separate. When a pellicle is formed as before, which will be at 66° or 68° , the same mode of procedure is to be adopted as in the first case, and a further deposit of crystals obtained. When the liquor is cold, it is again to be boiled, and the same process followed exactly as in the former cases. The deposit at this third boil being still soda salts, may be mixed with the salt from the second boil ; the liquor should be brought to mark 72° , and again set aside to cool. Some manufacturers now stop the further concentration, but the majority prefer boiling a fourth time, proceeding exactly as directed for the three previous boils ; all the deposited salt which falls during the last three boils, being soda salts, are stirred together. The first, or sulphate of potash, stored by itself, and the contents of the crystallizing vessels, or chloride of potassium, also kept separate. The liquor at the last boil should mark 74° .

The pans in which the evaporation is conducted are generally made about $7\frac{1}{2}$ feet across the mouth, with a depth of $3\frac{1}{2}$ feet. They should be set so that the flame may not strike the bottom of the pan, but play round the sides ; this is done by setting the bottom solid on clay, and building a small arch in front, so the

flame strikes the front of the pan, and dividing there, circle round the sides and escape into the chimney on the back. This arrangement allows the salts deposited to collect at the bottom, whence they are easily ladled out.

The Extraction of the Iodine.

The quantity of liquid by these series of boilings has now been reduced to one-sixteenth of its original bulk. Or to make it still clearer, allow that 16 pansful had been boiled at first, and now off the steeps; these by evaporation, and parting with a certain quantity of their soluble contents, are reduced to eight pansful, which again make four, and these two, until at the fourth boil one pan from the sixteen remains; this, as may be supposed, is highly concentrated, and holds in solution the iodine, in the form of an iodide or iodate of soda and potassa. After this liquor has become completely cold, it is ladled into an iron pan, (if lined with lead so much the better,) and is there subjected to the action of sulphuric acid; unconcentrated acid is best for this purpose; and to a quantity of liquor remaining after the process described as being the product of pans of the size indicated, from 8 to 10 carboys of acid will be required fully to saturate the free salts contained. The acid should be added gradually, as by setting two carboys over the neutralizing pan, and allowing it to enter the liquid by means of small leaden syphons, very copious evolutions of gas are liberated during this process, and as the mixture must be diligently stirred, it is better to have the operation conducted near the chimney, into which a hole has been made, closed when not in use by a damper; the draft carries off the noxious vapors, and is a great convenience to the workman. The acid should be added in till the liquor is very sour, and a few drops of acid added to a small quantity evolves fumes of iodine readily. The liquid will now have a creamy yellow appearance, and should be kept undisturbed (except skimming the sulphur from the top,) until next morning, when it is to be transferred to the stile for sublimation. The stile should hold the above mentioned quantity of liquid twice; its size should be about 4 feet in diameter, and $2\frac{1}{2}$ feet deep; the bottom cast to two inches thick, and set as a common boiler in brick-work; a leaden dome should fit into a flange round the rim, and

be luted with fine clay; in the centre of this dome a circular hole should be left about 18 inches diameter, with a flange round its edge, into which a small dome should fit, and be luted; this, as well as the larger, should have handles soldered on, so that they could be easily lifted off when required; in the smaller dome two flanged holes are made to receive the bent ends of the leaden arms, which are to convey the fumes of the iodine into the receivers or condensers. These arms are made of moderately thin lead soldered in the form of a tube; they should be about $3\frac{1}{2}$ inches in diameter, and their bent elbow luted into the flanged holes in the small dome. They should also at the top of the elbow have a small leaden plug like the stopper of a vial, which can be taken out occasionally by the operator to judge of the process of sublimation. The arms should be long enough to clear the edge of the stile about six or eight inches, their ends being there introduced into the receivers. These latter are large earthenware carboys laid on their sides, and having a neck and hole in the bottom. The end of the leaden arm is connected with the first receiver by having its end thrust about two inches clear into the hole in the bottom; the neck of this receiver is fitted into the bottom of the next, and so on through the series, which should consist of eight or ten placed in two rows, side by side, on a wooden frame; the two arms from the stile leading the iodine as it sublimes into them, where it condenses. All the places where the joinings are should be carefully luted with fire clay.

Having thus described the stile and its accessories, let us see how it is to be wrought.

The stile should be filled with the neutralized ley up to within six inches of the brim; the larger dome not being moved for this purpose, the hole for the smaller dome being large enough for filling. A fire is now kindled in the small furnace of the boiler, and the liquid heated up until the leaden dome feels pretty hot. Never having used a thermometer to determine the heat, I cannot indicate the temperature nearer; it must not, however, at this point reach a boiling heat. The smaller dome is now to be luted on, the arms are luted into their respective places in this dome, and into the ends of the receiver, and the oxide of manganese is now to be added. The quantity for a stileful, the size indicated, is from 60 to 80 lbs. finely ground; it is introduced

through a hole left in the top of the larger dome, near the side ; this hole is about $2\frac{1}{2}$ inches in diameter, and a wide funnel, such as grocers use, is inserted so as to facilitate the introduction of the manganese. When this is fairly introduced, it is rapidly stirred for a minute with a stick through the hole. The hole is then stopped with a wooden plug cased with thin lead, and the heat is gently kept up, until, on withdrawing the small stopper in the arms, the fumes of iodine are scarcely observable ; this, according to the quantity of ley, will be from three to six hours. The process completed, the fire is withdrawn, the arms removed from the end receiver, and the hole plugged with old cloth of any kind to prevent escape. The receivers are allowed to stand so until cool, when they are disconnected, and tilted gently to remove the condensed steam ; they may then be replaced and used three or four times before the iodine is removed. The liquor in the stile is then run off with a syphon, a stream of cold water being conveyed into it at the same time. As the acid liquor attacks the iron very readily, it is good economy not to neglect the emptying of the stile, but have it done immediately after the process is finished.

From the Proceedings of the American Pharmaceutical Association—1857.

REMARKS ON ERGOT.

By WILLIAM PROCTER, Jr.

At the last meeting of the Association, (1856,) among the questions proposed for solution, during the interval till the next meeting, was the following, which was accepted by the writer :

“ Does *Secalin*, the volatile alkaloid of Ergot, possess the utero-stimulant power of the drug itself ? Does Propylamin, as obtainable from ‘herring pickle,’ and from ‘Narcotin,’ possess the same power as *Secalin* ? In view of the result, what is the best formula for preparing a permanent fluid preparation of Ergot ? ”

It will be seen by the sequel, that only a part of this query has been answered, but it has been deemed best to report the following :

Ten thousand grains of powdered ergot was exhausted, nearly, with commercial ether in a percolator, and the residue spread on paper until the adhering ether had passed off. The

etheral tincture, exposed to spontaneous evaporation, yielded an oily residue of 2840 grains, which included a small portion of matter soluble in water and diluted alcohol, taken up by the ether, and deposited with the oil.

The dried residue of the ergot was mixed with water (containing six per cent. of alcohol, to retard fermentation,) macerated until each particle was saturated, introduced into a percolator and the same menstruum added gradually, until the passing liquid possessed but little taste or color. The liquid thus obtained was carefully evaporated to a syrupy consistence, then thrown into it five times its bulk of rectified alcohol, and the liquid filtered from the gummy albuminous precipitate. The alcoholic filtrate was then evaporated to six fluid ounces, poured into a tall glass alembic, and four ounces of liquid hydrate of lime (containing half an ounce of quick lime) added and mixed. A receiver containing a fluid ounce of water and ten minims of sulphuric acid, was accurately adapted and well refrigerated. The acidulated water was intended to fix the first vapors of secalin, which otherwise cause considerable tension in the atmosphere of the apparatus. The elimination of secalin was so rapid at first as to cause the contents of the alembic to boil over, and the receiver had to be changed, with some considerable loss from the escape of vapors, the room being strongly charged with the ergot odor of the secalin. On again distilling, with the receiver arranged as before, the process was pushed until the distillate amounted to six fluid ounces. This liquid had an alkaline reaction, all the acid having become saturated by the alkali: sufficient acid was then added to give an acid reaction, and one third of it set aside for therapeutical experiments. If a drop of this liquid is placed in a watch glass, and a drop of liquor potassa added, the odor of ergot is instantly produced, and if then a glass rod, moistened with hydrochloric acid, is held over it, abundant visible vapors of muriate of secalin will be observed. The residue of the acidulated distillate was placed in an evaporating dish and suffered to evaporate spontaneously until reduced to one eighth, and then finished at a temperature of 130° Fahr., (owing to a slight empyreuma having occurred near the close of the distillation, the evaporated distillate was colored brownish;) a crys-

talline mass of hydrochlorate of secalin remained, which had little if any odor of secalin.

The fixed oil was now examined. On washing it with a little acidulated water, the latter acquired color, and when mixed with potassa, the vapor of secalin was manifested by its odor, and when brought near hydrochloric acid. This shows that commercial ether removes a portion of the secalin, and points to the necessity of washing the oil with acidulated water when it is rejected from a preparation of ergot.

Two vials of the distillate, of an ounce each, were placed in the hands of two medical gentlemen, for trial, in the hope that they would be able to report in time for the meeting of the Association, but as yet no return has been made.

It was not deemed necessary to isolate propylamin (secalin) from herring pickle, until the secalin of Winckler was satisfactorily shewn to be the active principle of ergot, as the interest centering in the determination of that point was presumed to be common to both.

It remained, therefore, to prepare a formula for a fluid preparation of ergot which should fully represent its activity.

1. Mr. T. R. Baker and others have shown that oil of ergot, freed from adhering substances, is bland, and has the composition of castor oil, or at least that the fatty acid (ergotoleic acid) of oil of ergot has a similar constitution with ricinoleic acid.

2. The experiments above show that commercial ether does remove some secalin with the oil. This probably arises from the alcohol present in small quantities, and points to the propriety of using purer non-alcoholic ether.

3. Powdered ergot moistened with water exhibits an acid reaction with blue litmus, and Winckler asserts that secalin exists in ergot, combined with ergotic acid (of Wiggers.) On inserting a glass rod moistened with HCl into the atmosphere of a bottle containing powdered ergot, but little if any visible vapors are observed, yet there is a distinct well marked ergot odor.

4. Does the normal odor of ergot arise from a gradual disengagement of secalin, or is it independent of that principle? To answer this question, it is necessary to compare the odor of ergot and secalin. They are different—as different as valerian and valerianic acid—yet the odor of valerian is largely influenced by

the acid it contains. Further; the odor of recently dried conium is not that of conia, but of a peculiar volatile oil. But if conium is allowed to get old, the coniate of conia is gradually decomposed, the mouse odor of the alkaloid is given off, and the original conium odor greatly modified. Now the question arises, does there occur a gradual atmospheric decomposition of the natural salt in ergot, as of that in conium? Water distilled from ergot does not possess its peculiar odor; on the contrary, the decoction in the still retains the ergot smell, which is enhanced and modified by the addition of liquor potassæ. On the contrary, a few drops of diluted sulphuric or muriatic acid entirely destroys the ergot odor of the decoction. May we not plausibly infer from this that the natural odor of the ergot is due to secalin loosely held by the organic acid of ergot, modified by associated matters? and as a consequence of this inference, does it not follow that an acidulated menstruum should be used in treating ergot, when its solution is to be evaporated? It may be asked, will the replacement of ergotic acid by a stronger acid affect the therapeutic or physiological action of ergot? It is thought not, because in all cases of alkaloids the salts are more active, because more soluble; yet this point is easily settled by trial, which want of time alone prevents. In view of these several points, the following formula for fluid extract of ergot is offered:

Fluid Extract of Ergot.

Take of Ergot, in powder,	eight ounces (Troy.)	
Ether,		} of each a sufficient quantity.
Alcohol,		
Water,		
Diluted Acetic Acid,		

Pack the ergot moderately in a suitable percolator, and pour on ether slowly, until a pint and a half of tincture has passed, and having spread the residue of the ergot on paper, suffer the adhering ether to pass off by evaporation. Meanwhile agitate well the ethereal tincture with two fluid ounces of diluted acetic acid, and in a proper distillatory arrangement recover the ether by aid of a water bath heat. Add two fluid ounces of water to the oily residue, agitate, and when subsided decant the oil from the watery fluid, and set them separately aside.

Prepare a menstruum of two pints of water, half a pint of alcohol, and two fluid ounces of diluted acetic acid, and having moistened the ergot residue with a pint of it, allow it to macerate two hours, introduce it into a percolator and displace with the remainder of the menstruum, slowly, till exhausted. Mix this liquid with the acetic washings of the oil, and evaporate by means of a gentle heat, (say 150° F.) till reduced to four fluid ounces. To this when cold, add four fluid ounces of alcohol, separate the gummy precipitate by filtering, and wash the filter with sufficient diluted alcohol to make the fluid extract of ergot measure eight fluid ounces.

Fluid extract of ergot, thus prepared, is a laudanum colored fluid, thin consistence, a mild ergot odor and taste. A fluid drachm represents sixty grains of ergot, and the dose is from 20 minims to half a tea-spoonful, or by adding a tea-spoonful to a table-spoonful of sweetened water, a tea-spoonful of the mixture will equal ten or twelve grains of ergot.

Some may question the necessity of complicating the process by the preliminary ethereal treatment. The reason urged for its propriety is that ergot contains nearly, if not quite, a third of its weight in fixed oil, which shields the particles from the action of the watery menstruum, and obstructs its thorough action. If omitted, more care will be required in the exhaustion of the ergot, with the menstruum directed.

From the Proceedings of the American Pharmaceutical Association—1857.

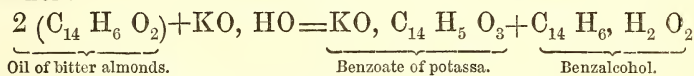
ON THE DETECTION OF A NEW FALSIFICATION OF OIL OF BITTER ALMONDS.

By JOHN M. MAISCH.

Sometimes we meet in our drug market with an oily liquid termed artificial oil of bitter almonds, the proper name of which is nitrobenzole, or nitrobenzide; it is benzole = $C_{12}H_6$, one equiv. of H of which is replaced by NO_4 ; making its formula $C_{12}H_5(NO_4)$. Its physical appearance has a remarkable resemblance to the genuine oil of bitter almonds, though its spec. grav. is about .16 greater, and its taste is sweetish instead of hot aromatic. The close analogy of its odor to that of the real oil, and its ready solubility in alcohol and ether, with both of which it may be mixed in any proportion, and its low price, being be-

tween $\frac{1}{4}$ and $\frac{1}{6}$ of that of the true oil, render it valuable as a substitute for the same in the manufacture of perfumery, and probably for other purposes; and in view of these facts, it is to be wondered at that the oil of bitter almonds has not been largely adulterated with this body, which will not diminish its odor, instead of alcohol, with which it is very often found sophisticated. It is, however, possible that such a practice has been going on to some extent without any of the consumers having become aware of it; at least, I do not recollect of having met with such a statement in any of the pharmaceutical journals. I happened perchance to witness such a falsification, seeing a wholesale druggist mix the two articles by equal weight, and it has been my endeavor to find out an easy and practicable way for the ready detection of such an admixture. In the following I offer such a test:

Oil of bitter almonds, $C_{14} H_6 O_2$, is, according to Liebig and Woehler, converted into benzoate of potassa by the action of caustic potassa in alcohol, by which, according to Cannizaro, also, benzalcohol is formed, a liquid heavier than water and insoluble in it, but soluble in all proportions in ether, alcohol and acetic acid. This decomposition seems to take place after this manner:



Nitrobenzole, when treated in the same way, undergoes a decomposition of quite a different nature; it parts with three equiv. of oxygen, which are supposed to combine with a part of alcohol to aldehyd, which under the influence of caustic potassa is again changed into a dark brown resin. The newly formed body $C_{12}H_5NO$, or probably $C_{24}H_{10}N_2O_2$, can be obtained in yellow crystals, is insoluble in water, soluble in alcohol and ether; it is the azoxybenzid of Zinin. The insolubility of this body in water, and the ready solubility of benzoate of potassa in the same menstruum, suggested to me the idea of employing caustic potassa as a test for nitrobenzole in oil of bitter almonds, and thus far it appears to be admirably adapted for this purpose.

About $\frac{1}{4}$ drachm of the suspected oil is dissolved in two or three drachms of alcohol, 15 grains of fused pure caustic potassa added, the mixture heated for a few minutes to dissolve the

potassa and expel most of the alcohol, until about one-third of the original measure is left, when it is set aside to cool. In several experiments made with pure oil in the above manner, the residue was a liquid of a brownish yellow color, without any sign of crystallization, and was wholly soluble in water, with but a very slight turbidity. The adulterated oil above referred to, on cooling, became a hard crystalline mass of a dark brown color, while a little caustic potassa remained in solution, free of color, below the crystals. The whole residue, when agitated with water, furnished a very turbid liquid, from which a large quantity of a yellowish brown sediment had separated in the course of a few hours; the supernatant liquor remained turbid after a week.

A small quantity of the adulterated oil mixed with the pure article furnished, after the above treatment, an aqueous solution, which, on standing a few hours, became clear, and deposited a yellow crystalline powder. With the proportional increase of nitrobenzole in pure oil of bitter almonds, the last solution retained its turbidity for a longer time, and the crystalline sediment increased in bulk.

The above test takes but a few minutes to perform, and the cost is a mere trifle; the operation is very simple, it does not require any apparatus, and may be made over a spirit lamp or in a water bath.

In connection with this, I would state that I have often found otherwise pure oil of bitter almonds adulterated with alcohol. The easiest way to detect the same is Redwood's method, by means of nitric acid; pure oil dissolves in this liquid at ordinary temperature without decomposition; a small quantity of alcohol, however, if present, is acted on by the nitric acid with the evolution of nitrous acid fumes. Nitrobenzole is likewise soluble in cold nitric acid without undergoing any change even on heating. The nitric acid test therefore ought not to exclude the potassa test, to be satisfied about the purity of the oil. How *small* a quantity, however, of *nitrobenzole* may be detected by means of caustic potassa, and how the *per centage* of such an adulteration may be readily found out, I am at present not prepared to say: future experiments, however, I hope, may determine these facts.

Philadelphia, Sept., 1857.

REMARKS ON SENNA PASTE.

Cambridgeport, (Mass.,) Aug. 29, 1857.

To the Editor of the Journal of Pharmacy :—

DEAR SIR,—Some months ago I was led to consider the expediency of forming a senna paste, which should be stronger, more agreeable, and of milder operation than the officinal senna confection; and at the request of an acquaintance, I made some experiments with reference to that object. The idea was originally suggested from noticing the kindly effects of the fluid extract of senna when made from the cold infusion, and the main difference between the proposed aromatic paste and the confection consisted in the use of the solid aqueous extract of senna instead of the powdered leaves.

In proposing a formula for such a preparation, it should be borne in mind, that the cathartic principle is to be increased and somewhat modified in its action, the paste is to be of firmer consistence than the confection, and the taste is to be improved. The first would be gained by using a sufficient quantity of solid extract of senna; the second by using an extract made from the cold infusion; the third by adding gum arabic and perhaps powdered liquorice root, and the fourth by adding flavoring oils or spices, or both.

The following formula may serve as a guide to any one disposed to follow up the subject.

Take of Tamarinds,

Prunes,

Figs,

Solid Aqueous Ex. Senna, each . . . $\frac{1}{2}$ lb.

Gum Arabic, Sugar, each . . . 1 lb.

Pulv. Liquorice root, . . . 4 oz.

Pulv. Coriander, . . . 2 oz.

Fresh Oil Caraway, . . . 1 dr.

Boil the figs, prunes and tamarinds in water, and rub through a coarse seive, allowing the seeds of the figs to pass. Dissolve the sugar and gum in as little water as possible and strain. Add this product to the fruity pulp, and evaporate to a dense consistence. Add the extract, previously softened by a gentle heat, and stir until well mixed. Then add the liquorice root, and when

nearly cold, the oil of caraway, beating until well incorporated. Transfer to a drying closet, and cut in squares, or run in moulds for use. The cakes might for better preservation be encrusted with sugar, or dipped into an ethereal solution of tolu.

The proportions here given I do not propose as the best that could be taken. Any skilful apothecary will understand the manipulations required, and is competent to modify and improve upon these hints.

I must in honesty confess that the result of my trials was not satisfactory. The paste did not seem to possess much advantage over the officinal preparation, and from its tendency to absorb moisture, was decidedly inferior, as an article to keep on hand. Again, senna when administered in substance, has always appeared to me to act more kindly than when given in infusion or tincture.

The confection of senna is brought into disrepute from the fact that druggists do not generally prepare, as they ought, what they require for dispensing purposes, and there is little in the market made according to our Pharmacopœia. When so made it is "One of our best and most pleasant laxatives." Undoubtedly the general omission of Cassia Fistula weakens its cathartic power, an omission which is excused on the ground of a want of supply. I have never found any great difficulty in procuring the article, and believe with the authors above quoted, that should a demand be created, a plentiful supply would be sure to follow.

Very respectfully your obedient servant,

HENRY THAYER, M. D.

SOME NOTES ON THE MANUFACTURES OF GRASSE
AND CANNES.

By DANIEL HANBURY.

That portion of the South of France which borders the Mediterranean between Toulon and Nice, is noted for its mild, salubrious climate, and also for the growth and manufacture of several productions of interest to the druggist and the perfumer.

A recent visit to the district in question, and especially to the

towns of Grasse and Cannes, having given me the opportunity of seeing something of the manufactures there carried on, I have thought that a few lines on the subject might prove acceptable to the English readers of the *Pharmaceutical Journal*; let it be remembered they are but the notes of a passing stranger, and as such not to be taken for more than they are worth.

Grasse is a town of some 13,000 inhabitants, lying at the foot of a range of mountains, and open to the Mediterranean, from which it is distant about eight or nine miles. The olive is cultivated in great abundance in all the adjacent country, and grows far more luxuriantly than in many other olive districts of the South of France. The mildness of the climate is still more manifested by the orange trees, which, with here and there a date-palm, form a striking ornament of the little town gardens of Grasse. The other plants that are cultivated are the Rose, the Jessamine (*Jasminum grandiflorum* L.), Mignonette (*Reseda odorata* L.), and Tuberose (*Polianthes tuberosa* L.)

Cannes, a small town situated on the shore of the Mediterranean, about ten miles from Grasse, enjoys a climate still more favored. The orange is cultivated more extensively; the rose, jessamine, and other plants under culture at Grasse are likewise grown on a large scale at Cannes; and in addition we find the Geranium (*Pelargonium radula*, Ait., var. β *roseum*) and Cassie (*Acacia Farnesiana*, Willd.) the latter in considerable abundance.

Two species of orange are cultivated about Grasse and Cannes, one known as the *Bitter Orange* or *Bigaradier*, the more esteemed and more extensively grown, the other as the *Sweet* or *Portugal Orange*.

Orange-trees are grown in all the country in the neighborhood of Grasse, but especially in places in the vicinity of the coast. When the season arrives, the flowers are collected by itinerant agents called *Commissionaires*, who bring them from the growers to the distillers, their remuneration being the small commission of one *sou* per *kilogramme*, or about $\frac{1}{4}$ d. per lb.

The finest Neroli and finest Orange Flower Water are distilled from the flowers of the *Bigaradier*. Inferior Neroli, not worth more than half the price of the finest, is yielded by the flowers of the Sweet or Portugal Orange. The essential oil called *Essence de Petit Grain* is distilled from the leaves of the

Bigaradier : the distilled water mixed with that of the flowers, is sold as an inferior quality of Orange Flower Water.

Roses are cultivated close to the town of Grasse, as well as in all the country adjacent, often on a very small scale and in situations apparently very arid. In the month of May the flowers are collected daily, and brought by the growers to the manufactories for sale.

The Rose Water of Provence is of a very superior quality : essential oil or Otto of Rose is separated from it after distillation. This otto differs from the Turkish, even from the purest specimens, in remaining congealed at a much higher temperature. In the market it commands a far higher price than the Turkish Otto, being worth from 1800 to 2000 francs the *kilogramme*. Equal to (say) 41s. to 45s. per oz. It is but little in demand, and the supply is comparatively small.

The Jessamine, which is cultivated upon an extensive scale, is *Jasminum grandiflorum* L., a species with large white, exceedingly fragrant flowers. The plants are all grafted upon stocks of *Jasminum officinale* L. : they are planted close together in rows, and are not allowed to attain a height of more than about two feet. They are kept of this low stature in order to facilitate their protection from cold, which is effected by heaping the earth completely over their stems at the commencement of winter. Jessamine flowers are in season in July and August : they are chiefly employed to communicate their odor to oils and pomades. Jessamine water was shown to me by one manufacturer.

The *Cassie*, *Acacia Farnesiana* Willd., is cultivated chiefly about Cannes, where it is to be seen forming a bush or small tree. Its flowers, which are very fragrant, are used in perfuming oil and pomade : they are produced in September, and are worth five to six francs the *kilogramme*.

The Geranium is cultivated for the purpose of obtaining its essential oil. The Tuberose is grown at Cannes, as well as at Grasse, its deliciously fragrant flowers being used, like those of the *Cassie*, for scenting oil and pomade.

The establishments where the distillation of essences and waters and the manufacture of other articles of perfumery are carried on, are many of them of considerable extent, and kept up in a style of great completeness. The stills are of copper, and heated

by a naked fire; they are mostly, if not all, of small size, compared with the great stills used in this country. Their small capacity is, however, compensated by their numbers, some manufacturers having a dozen and others twice that number. In one operation which I saw in progress, the charge of the still with leaves of the Bigarade Orange was about 80 lbs.

In addition to the manufacture of essential oils, an important branch of industry consists in the preparation of scented fatty oils and pomades. These are prepared by one of two processes, called respectively *Infusion* and *Enfleurage*.

Infusion consists, as the name implies, in infusing the substance whose odor is to be extracted, in a mixture of lard and beef-fat melted in a water-bath, or in warm olive oil. The chief substances thus treated are the flowers of the Rose, Cassie, Bitter Orange and Violet. Mignonette is also sometimes subjected to this process. The flowers are immersed entire, except in the case of Orange Flowers, which are previously bruised. After immersion in the fatty menstruum for a requisite period, the mixture is strained off and the residue pressed. The pomade is preserved in large metal vessels, some of which have a capacity of 300 *kilogrammes*.

The process of *Enfleurage* is resorted to in extracting the odor of the flowers of Tuberose, Jessamine, and Mignonette. The apparatus required is merely a number of shallow wooden frames of about 18 by 15 inches, enclosing at half their depth a sheet of glass. The edges of the frames rise about an inch above each surface of the glass, and being flat, the frames stand securely one upon another, forming often considerable stacks. The technical name for the frames is *Chassis*: those just described are called *Chassis aux vitres*, or *Chassis aux pommades*, to distinguish them from a different form, which is used where oil has to be submitted to the process of *Enfleurage*. The process in the case of pomade is thus conducted: the unscented fat (which has about the consistence of spermaceti ointment,) is weighed into portions, each sufficient for one side of the sheet of glass of a *chassis*. It is then spread over the glass with a spatula in a layer hardly a tenth of an inch thick, care being taken by employing a little inner frame during the spreading, that the fat does not come in contact with the woodwork of the *chassis*. One surface

of the glass having been thus coated, the other is coated in like manner; and the *chassis* is ready to receive the flowers. These are now thinly sprinkled, or rather laid one by one upon the surface of the fat, where they are allowed to remain until the next day or day after, when they are removed and fresh flowers supplied. The *chassis*, charged with fat and flowers, are stacked one upon the other, forming in fact a number of little rectangular chambers, the upper and lower surfaces of each of which, are of glass covered with a thin layer of fat sprinkled with flowers, the sides being of wood. In one manufactory which I inspected, only one surface of each *chassis* was coated with fat, the jessamine flowers being placed in an abundant layer upon the other surface: in another establishment, flowers of mignonette were being similarly treated. In this arrangement the flowers do not, of course, come in contact with the fat, but the latter is simply suspended above them to receive and absorb their odor. The flowers require changing either daily or every other day for forty or fifty days before the pomade is sufficiently impregnated with their odor. It is essential that all flowers employed in this process should be collected during dry weather.

When oil has to be impregnated with the odor of flowers, a *chassis* is used which is of larger size, and has a diaphragm of coarse wirework instead of glass. Upon this diaphragm is laid a cotton cloth of a peculiar, thick, absorbent texture, soaked with oil; flowers are then spread upon it, and renewed daily until the requisite odor has been obtained. The oil is then pressed from the cloth and filtered: each cloth imbibes about 2 lbs. of oil.

The preparations called by the perfumers *Extracts* are made by treating the highly-scented oil or pomade with spirit of wine, so as to dissolve out the essential oil which either may have absorbed from the flowers with which it has been placed. This process is more usually conducted by the general perfumer than by the distiller and manufacturer of Grasse or Cannes, the business of the latter being more particularly with what he terms the *matières premières*. The pomade or oil, after having yielded to spirit the greater portion of its odor, is yet valuable for other purposes to which the manufacturing perfumer can readily apply it.—*London Pharm. Journ.*, Sept. 1, 1857.

ON HUANOCHIN, AN ALKALOID IN PERUVIAN BARK.

By B. H. PAUL, Ph. D.

Some ten years since a sample of bark was imported into Bremen, which was at first sold under the name of *Cortex Peruv.*, and described by Delondre and Bouchardat under the name of *China de Huanuco plana*. It appeared to have been collected from *C. nitida* in the woods of Huanuco. Hr. Erdmann describes this bark as being generally free from periderm, and presenting the greatest resemblance to *China calisaya* (*regia plana*,) but differs from it in the loose texture, slender wedge-shaped form, in the irregular cavities in the surface of the derma, and in the thin, soft, fissured periderm, covered with colored lichens and fungi.

When chewed, this bark has a sharp taste, but is not astringent or bitter, and it contains a peculiar alkaloid, to which Hr. Erdmann has given the name of huanochin. He obtained it by the following method :—

Four pounds of the crushed bark was boiled with 54 pounds of water and two ounces of hydrochloric acid (1.2 sp. gr.) pressed, and again boiled with fresh acid and water twice. The clear liquids were mixed with caustic soda until slightly alkaline, and the precipitate thus produced was washed with water and dissolved by acetic acid, which left a reddish-brown residue. Caustic soda precipitated from the acetic solution a tolerably colorless substance, which was digested with alcohol until nothing further could be extracted. The alcoholic solution was decidedly alkaline, and when concentrated, yielded shining crystals, which were rendered colorless by means of animal charcoal and recrystallization. One pound of bark yielded about one drachm of the alkaloid.

The characters of this base show that it differs from quinine as well as from the other bases of bark. It crystallizes in small prisms and has no taste, though the alkaline solution is slightly bitter. It is almost insoluble in water, at 62° F. it dissolves in 400 parts of alcohol of 80 per cent., and at the boiling point in 110 parts of alcohol. It dissolves in 600 parts of ether at 62° F., and in 470 parts of boiling ether. It melts readily and sublimates; it burns with a smoky flame, and does not leave any residue.

The sulphate of this base is almost insoluble in water, readily

soluble in excess of sulphuric acid, sparingly soluble in alcohol and in ether. The hydrochlorate is copiously soluble, crystallizes in large clear prisms of a very bitter taste.

The double salt with chloride of platinum is a pale yellow crystalline powder, sparingly soluble in hot water, alcohol, or ether, but more soluble in excess of chloride of platinum, from which solution it may be obtained in well-developed crystals.

The soluble salts of this base give with caustic and carbonated alkalies, white precipitates; with infusion of galls, a white precipitate; with chloride of gold, a yellow precipitate; with perchloride of iron, potassio-tartrate of antimony, sulphate of copper, iodide of potassium, and oxalate of potash, they do not give precipitates. Chloride of mercury forms with it a white insoluble double salt.

The analysis of this base and of its hydrochlorate and the double salt with chloride of platinum gave the following results for 100 parts :—

				Calculated.
C.	77.54	77.68	—	77.92
H.	7.73	7.76	7.71	7.79
N.	8.81	—	—	9.09
O.	—	—	—	5.15
				<hr/>
				100.00

The hydrochlorate gave 19.30 per cent. of chlorine, and the platinum compound 27.81 and 27.80 per cent. platinum.

These members agree with the formula $C_{20}H_{12}NO$, which requires 18.63 per cent. chlorine, and 27.50 platinum. This base is therefore isomeric with quinine.

The therapeutic value of the hydrochlorate of this base has been tried by Drs. Homeier and Schmidt, both of whom consider that it is an efficient remedy for intermittent fever.

OCCURRENCE OF TANNIC ACID IN PLANTS.

By B. H. PAUL, Ph. D.

It has been thought that tannic acid is not one of the earliest products of assimilation in the plant organism, but rather among the number of substances which are not included within the circle of vital action; that it is a product of the oxidation of cells that have lost vitality. Dr. Karsten has been led to question the cor-

rectness of this opinion, by his observations made upon the fruit of *musa sapientum*, which in the ripe state contains a very large amount of sugar, and in the unripe state is full of starch granules, with the exception of some longitudinal rows of wide tun-shaped cells, lying in the midst of the starch tissue, similar to sap vessels, and arranged concentrically in the substance of the fruit. These wide cells contain a clear juice, with small floating transparent vesicles, which give a fine blue color with perchloride of iron solution, while the other parts of the fruit do not give any such coloration. He considers that there is no doubt the tannic acid in this case is produced in the midst of the starch tissue, and not in parts of the plant that were subject to incipient decay, but in those parts which are in a state of normal development. The leaves of this plant contain tannic acid in rows of cells, and in vessels formed of the union of such cells. Dr. Karsten has observed the same fact in a number of other plants. In some instances the cells and vessels containing the tannic acid become very much thickened, which would seem to support Pettenkofer's opinion, that the production of tannic acid is closely connected with the production of wood.

The parenchyma of leaves also contains tannic acid in the cell juice. In gall-nuts the whole tissue is saturated with this substance. It would seem that a vessel containing tannic acid, which in the oak is produced in the wood cambium, is punctured by the insect, and in this way an opening is made, through which the tannic acid is poured into the tissues, and gives rise to the abnormal condition of the organs.

According to Dr. Karsten, tannic acid does not occur free in plants, but combined with another substance that is coagulated by alcohol and by acids. This compound is decomposed by contact with atmospheric air, and then the reaction with perchloride of iron takes place. This is shown by the fact, that when a cutting of a plant is immersed in perchloride solution, the tannic acid does not enter into combination with the iron until the cutting, after being impregnated with the solution, is exposed for some time to the air. It is only in those tissues of plants which are exposed to the atmosphere, by pores or otherwise, that the blue coloration indicative of tannic acid is produced immediately, by the application of perchloride of iron.—*London Pharm. Jour.* September 1, 1857.

THE SOLVENT POWERS OF GLYCERIN.

By JOHN S. BLOCKEY.

Some time back, having occasion to experiment with the disulphate of quinine, I accidentally discovered that glycerin, if gently heated, will dissolve more than 8 grs. per fluid drachm, or about one-twelfth of its weight of this salt; this fact will render glycerin a valuable vehicle for the therapeutical administration of quinine, as I noticed in a communication to the "*Lancet*" a few weeks ago. I have since found that glycerin appears to possess properties that may, perhaps, give it a place among the usual dissolving substances; for instance, salicin soluble in 22 parts by weight of cold water, and in 30 parts of 80 per cent. alcohol, will dissolve in 8 parts of cold glycerin; santonin soluble in 250 parts of boiling water, and in 3 of boiling alcohol, will dissolve in 18 parts of boiling glycerin; the solution, however, becomes thick and almost solid, with only one grain of santonin in 36 of glycerin on cooling, and a saturated boiling solution of santonin in glycerin, when cold may be inverted without loss.

Strychnia is soluble in 80 parts of boiling glycerin, but very slightly in cold.

From these experiments it appears that many substances are soluble in glycerin, in a very different ratio to their solubility in water, &c. Iodide of lead dissolves sufficiently in boiling glycerin, to cause the solution to become turbid on cooling. Aconitina is scarcely soluble at all in this medium. May not glycerin be found a solvent for many other comparatively insoluble substances, both in the inorganic and in the organic kingdom?

I invariably heat the glycerin to give it greater fluidity, and the quantity that may be thus dissolved, the solution remaining clear on cooling, I estimate as the quantity soluble in cold glycerin.—*London Chemist, September, 1857.*

PREPARATION OF IODIDE OF BARIUM FROM WITHERITE.

By C. R. C. TICHBORNE.

As iodide of barium is used in photography, and as iodide of aluminium (another salt proposed as an iodizer) may be made

from it, I give the results of some experiments to which I refer in this month's *Photographic Journal*, considering that they may be useful to the manufacturing chemist.

On treating powdered witherite with iodide of iron, we do not get a complete decomposition even after prolonged ebullition. To decompose it, native carbonate is generally heated with charcoal, which accelerates the decomposition, as it requires a violent heat to drive off the carbonic acid from the witherite alone.

If we keep a mixture of witherite and half its weight of iron filings or borings (those from malleable iron are preferable) at a slow red heat for some time, in an iron or black lead crucible, the carbonate is decomposed, carbonic oxide being liberated. The heat must not be sufficient to run the iron. If the roasting has been carried far enough, the contents of the crucible are found to be strongly alkaline. On adding water and iodine, and then boiling for some time, the iodine forms iodide of barium, combining first with the excess of iron, and is then converted into the barium salt. The residual precipitate, which seems somewhat similar in composition to artificial magnetic oxide of iron, is, from its density, easily washed. The liquors, on evaporation, yield crystals of iodide of barium, which on recrystallization are chemically pure.

This process is much preferable to that of making hydriodic acid and dissolving the carbonate in it, particularly when operating on a large quantity.—*Ibid.*

DECAY OF GUTTA PERCHA.

From the reports of Mr. E. Highton on the state of the underground wires of the British Electric Telegraph Company, published in the *Journal of the Society of Arts*, it appears that wherever the wires had passed near the roots of oak trees they had failed, whilst in other parts, only a few yards distant, they were perfectly sound. On examining the soil a whitish looking plant was detected, resembling the spawn of the mushroom, or some other fungus; the plant had spread over and around the wooden trough, covering it with a whiteness resembling white-wash, and wherever it had touched the gutta percha wires the gutta percha was rotten; a yellowish-green fungus, of which this

plant was supposed to be the spawn, was found growing luxuriantly under the oak, but not under any other tree. The plant possesses a powerful odor, at once detected on breaking the soil. The presence of the plant and the decay of the wires were found coincident; the absence of the plant and a most perfect state of the wires coincident also. It was found that the wires in one locality passing under two oak trees were not injured; in this case no fruit of the fungus could be found in the soil, although plentiful under other oak trees in the neighborhood. With reference to the decay of gutta percha in iron tubes it was found at Winslow that the wires through the entire lengths of the iron pipings were in a state of decay, whilst the wires in the wooden boxing were found perfect. The decay in this case appears to be produced by a cause entirely different from that under the oak trees. The following is the result of Mr. Highton's investigation:—

With reference to my experiments on the action of the mycelium of a fungus on gutta percha, I have for some months been growing one of the class called *agaricus campestris* in contact with gutta percha.

1. find as the result that the mycelium of this fungus does rapidly destroy the insulating properties of gutta percha; and in fact it appears to decompose entirely this vegetable gum. I send a sample showing the decay.

I am trying further experiments, an account of which I hope ere long to lay before the Board.

A few days ago I examined a spot near Canterbury, where the gutta percha of the wires had entirely decayed.

The soil was pure, clean, sharp, red sand, and there appeared nothing in such soil to induce decomposition.

But at that spot I found a young oak tree, which could only derive its nourishment from the ground through which the wires passed. And upon these roots, both living and dead, I found what I believe to be the mycelium of a fungus, the same as that which I discovered under the oak trees at Berkhamstead.

I send with this some of those roots upon which the fungus can be distinctly traced. The odor arising from that fungus appears to be identically the same as that from the fungi at Berkhamstead.

Ten yards distant was also another young oak tree, and at that point the gutta percha of the wires had also decayed. I will again communicate with the Board when I have made further investigations, but at present I feel bound to say that the presence of the mycellium of a fungus, and the decaying of the gutta percha covering of the telegraphic wire, being so constantly associated together, I can come to no other conclusion than this—viz., that the mycellium of a fungus will cause decomposition in gutta percha, and probably in most other vegetable productions.—*Lond. Pharm. Journ. Sept. 1857.*

DESTRUCTION OF THE GUTTA PERCHA TREES IN SINGAPORE.

A correspondent of Hooker's *Journal of Botany* makes the following observations on the destruction of the gutta percha trees in Singapore:—

“I have commenced to collect all the different guttas that are brought to Singapore in the Malay and Bugis prahus, and when I have succeeded in procuring specimens of the principal part of them, I will send them to you.

“Many of those passing under different names, however, are merely different qualities of the same stuff, or prepared in a different manner. Seeds of the gutta percha tree, and flowering specimens of the plant, I am afraid I shall not be able to procure in Singapore, as we have nothing but very small trees left in the island now; all those old enough to yield even a very small quantity of sap having been cut down by the Malays; but Sir James Brooke, who has been staying here, has promised to send me both from Sarawak, where there is no difficulty in procuring them, there being abundance of full-grown trees still.* The trees are always cut down here to procure the sap, though I have no doubt it is very bad policy to do so, since by tapping

* “The Borneo gutta percha, we believe, is much less esteemed than that of Singapore, and from specimens of the leaves that have been sent us by Sir James Brooke, it would appear that the species is different from the true gutta percha. The veritable *Isonandra gutta* has, however, recently been detected in Sumatra, and a specimen has been sent to us by our excellent friend Professor de Vriese, of Leyden.—ED.”

them a good quantity of sap easily runs, and it might be repeated again after giving the trees a reasonable time to recover. Natives will never consider any future advantage, their great object being to get the largest quantity at a time. Their argument, too, that unless the trees were private property, and could be looked after, it would be impossible to protect them from one's neighbors, is very true; and this would be quite out of the question in the extensive forests where the gutta trees are found. At some future period, I have no doubt the gutta percha tree will be quite extirpated in all the countries about Singapore. Being always cut before it has a chance of seeding, it cannot continue to exist unless the price rises to such an extent as to make it worth while planting the tree on private property.

"It is to be found (the identical species?) over nearly the whole Archipelago that is inhabited by the Malay race, but as far as I know does not extend further to the east. True gutta percha is called *gutta tabban*; most of the other guttas are varieties of caoutchouc. Neither the Malays nor the Chinese make much use of gutta percha, as far as I have seen. Knife-handles and small buckets seem to be the principal uses they put it to; it is sometimes made into bands for tying things with also, but I have not often seen it used in this way.

"The quantity of gutta percha exported from Singapore in 1855 was about 1900 tons, but this year it will be much short of that amount, probably not over 1500 tons. Its present price is 22 dollars per picul ($133\frac{1}{2}$ lbs.) for good quality.

"P. S. The principal other vegetable substances exported from here are gambier, camphor, sago, pepper, coffee, sugar, sapan-wood, mangrove-bark, nutmegs and mace, rattans, canes, cubebs, gum benjamin, dragon's-blood, gamboge, vegetable tallow, vegetable wax, gum copal, cloves, tapioca, arrowroot, rice, cassia, gum elastic, sea-weed, sandal-wood, galangals, rhubarb, cutch, ginger, teal-seed, ebony, cocoa-nut oil, wood oils, betel-nut, cardamoms, China-root, timber, besides others which escape my memory at present."—*London Pharm. Journal*, 1857.

SOLUBILITY OF IRON AND OF GELATINOUS PROTOXIDE OF IRON
IN COD-LIVER OIL AND OTHER FIXED OILS.

By M. VEZU.

1. Metallic iron and gelatinous protoxide of iron dissolve in the cold in cod-liver oil.

2. Water is, in most cases, required to promote the solution, excepting with iron reduced by hydrogen, which dissolves without such aid.

3. Oil of sweet almonds dissolves iron, and acquires a mahogany red color.

4. Olive oil, castor oil, &c., dissolve iron without becoming sensibly changed in color.

5. Oxide of iron dissolves with more facility, in proportion as it has been more recently prepared, is humid, and has not been exposed to the air.

6. Iron dissolved in oil is always found in the state of protoxide.

7. Ether dissolves these oils, just as it would the same oils in their natural state.

8. The other oxides of iron are scarcely at all soluble in oils, either with or without the aid of heat—*London Pharm. Journ.*, Sept. 1857, from *Rep. de Pharm.*

Varieties.

On the Iron-Wood of Borneo.—Hooker's Journal of Botany contains a letter from James Motley, Esq., from which we make the following extracts. Mr. Motley writes from South Borneo, January 10, 1857.

With the introduction to the "Flora Indica" I was very much delighted, and above all with that most excellent chapter on variations of species.

I have at this particular station some beautiful opportunities of studying these variations from the great varieties of soil, from salt-marshes, through fresh water-marshes, gravel, coal-rocks, green-stone, and metamorphosed coal-rocks, up to the great range of serpentine hills which bound our coal-field. I have particularly observed the marked effect of this last soil (serpentine) upon the color of flowers; a very great number of plants, having red or purple flowers, become pale or white on the serpentine.

I believe I have hit at last upon the right way of drying succulent plants, and such as are to come to pieces; and if nobody has thought of it before,

it is really worth telling you. I had previously tried hot water, but that made the specimens mouldy; then a hot iron, but that is tedious, and it spoils the flowers; pricking the leaves all over with a pen-knife or a fork, so as to let the water escape, is a great assistance to the drying of Orchidæ and Hoyas, but the specimens look unsightly after it; and chloride of calcium paper is too much trouble, except for an occasional pet specimen. I now simply put the plants into a large bottle with weak spirit for one or two nights; this effectually kills them, and an endosmosis goes on in the tissues which breaks them up, and makes them dry almost as quickly as other plants.

The wood of the Kayu Oulin, or Iron-wood of Borneo, is perhaps the strongest in the world. I tested a piece of it, one inch square, and forty-two inches between the supports, and it bore, suspended from the centre, 338 lbs. before it gave way: its deflection was then about eight inches. I believe this is the greatest strength recorded of any wood. The wood, when fresh cut, is light-brown, but becomes of a deep reddish-black, and finally quite black when old. It is used here by the natives almost universally for boats and houses, though very heavy. It is now becoming scarce, and difficult to procure in large pieces, except from the interior of the country, where it must exist in large forests. The trees are large and majestic, the trunk very straight and the bark thin and scaly. This wood appears to be almost indestructible. A sort of paling or stockade which surrounds the Sultan's house at Martapura, is known by undoubted evidence to have been standing a hundred and thirty years, without even the protection of paint, and it shows no signs of decay; and the old Kraton, or palace, is still older. It is built entirely of Oulin, and the enormous posts and beams are all over elaborately carved, and have been formerly painted and gilt in arabesque; but this magnificent room is now neglected and disused, except on great occasions. All over the padangs or great grassy plains of this country, the Oulin clumps stand up, white and ghastly mementos of the vast forests which once covered the whole district, and of which the oldest natives have no recollection; the stumps were there when they were young, and to all appearance will be there for a hundred years longer. In many cases they are hollow, and then a large tree has frequently grown in the centre, and by its gradual increase split the Oulin into three or four pieces. In some places the padangs are covered with trees, which thus look as if they grew in huge flower-pots, and whose roots squeeze themselves in strange shapes through the cracks of their ancient pedestals, which have preserved them when young from the fires which, in the dry season, sweep-roaring and cracking across the padangs, destroying every living leaf.

The trees chiefly seen in the padangs are *Vilex tomentosa*, *Emblica officinalis*, and some two or three others, whose bark, being very full of sap, resists the fire for a moment or two. That is enough, for the tempest of flame, fed only by grass, is gone in an instant; and when a tree has, by one accident or another, survived three or four years, it is safe from such

immediate destruction. These padang trees, however, after all, are destined to perish by fire. A bit of bark is killed or knocked off, perhaps a dead stick has rested against it, and given the fire time to kill the bark, or a buffalo rubs his horn, or a pig whets his tusk there. Then the verdict has gone forth; next year the bit of bare dead surface burns long enough to kill further the edges of the wound, which is next year, and every year, more and more extended, till the tree stands up, as upon a stick, which gives way to the first storm, generally however alive to the last moment. Wherever a group of trees, other than of these few species, is seen on the padangs, it is a pretty sure sign of nearly bare rock, or gravel, too barren to carry *Alalang* (*Imperata Koenigii*) sufficiently thick to conduct the fire. The changes in the appearance of these vast grassy plains within a few days is indeed singular. After the long dry weather they are a light greenish-yellow; the fire passes, and leaves them black; in three days more they are the lightest and freshest of green again; and in ten days after the fire they are white; as if a snow storm had fallen upon them, with the waving plumes of flowers, which never appear except after fire, though it be delayed several years.

Of course these fires destroy all that is above ground of thousands of sapling trees, but the roots remaining alive throw up fresh shoots; these in their turn are burnt off year after year, fresh shoots are thrown out from the edges of the stool, which becomes at last a thin distorted disc of wood, fixed to the ground by innumerable perpendicular fibres, and burnt perfectly smooth on the upper surface. These bare stools, sometimes eighteen inches in diameter, have a strange appearance immediately after the fire, but are soon again hidden by the grass.

On Chinese Botany and Pharmacology, and the Latest Russian Researches Thereon. By Dr. LOTSKY. It is necessary to premise, on the present occasion, that the Russian Government is the only one which, since the last century, entertains an especial Diplomatic Mission at Peking, located in buildings of great extent. Amongst the staff of the mission is also a Medical Officer, whose term of residence in China was formerly fourteen years, but has been lately shortened to seven. Several of them have occupied their leisure in researches on the different departments of Chinese medical science.

It was thus that Dr. Kiriloff had collected, so far back as the year 1841, 127 different Chinese drugs, which he brought with him to Russia, and where they were first deposited in the Foreign Office of St. Petersburg. In the year 1847 these specimens were transferred to the Museum of the Medical and Surgical Society of St. Petersburg, and Mr. A. Horaninoff, member of the Academy, and Actual Privy Councillor, was commissioned, by an especial order of Nicholas I., to study them and to make a clinical examination thereof. As a preliminary, Dr. Kiriloff had made extensive researches into a large number of Chinese medical works,—a kind of

Eastern literature, but very little known hitherto in Europe ; but by the knowledge of which alone a clue to the usage of unknown Chinese drugs could be obtained. In the meantime the members of the Medical and Surgical Academy had examined them chemically and physiologically. Finally, forty Chinese drugs (unknown in Europe), were tried on thirty-seven hospital patients with the most satisfactory results.

While these researches were going on in St. Petersburg, Dr. Tatarinow, who had remained ten years in China, returned home in 1851. The doctor had studied and translated Chinese medical works while in China ; he had made collections in Pekin, and in a radius of 300 kilometres around that capital, so far as Mongolia, the results of which were 800 species of plants in a number of dried specimens for the herbarium, and a vast collection of 500 sorts of drugs, some in such quantities as to allow a large scope for experiments and *exchange* with other medical establishments in Europe. At the same time most of these plants had been drawn in a superior way, in folio, by a Chinese artist, but as Dr. Tatarinow superintended the painting, most detailed analyses of the plants are added, which greatly enhance the value of the collection. Very interesting in these portfolios are the many varieties of the genus *prunus*, *pyrus*, *malus*, (plums, pears, and apples), exhibiting most curious and monstrous forms of these trees and their fruit, originally brought here from *other* parts of Asia. If the accuracy of Chinese chronology, with its vast series of years, could obtain any additional evidence, it might obtain it from these forms of cultivated fruit. Ages must have passed by, until the very nature of organisms could have become thus changed, and, as it were, transmuted. This portion of Dr. Horaninoff's intended work will not be the least interesting for phyto-logy and horticulture, as it is known that the Chinese, who can rear an oak-tree with acorns only a span high, are very expert in the latter branch of science.

From the collections of Drs. Koriloff and Tatarinow, it would appear that the Chinese possess drugs and medicines innumerable. Some of them, as derived from Dr. Horaninoff's note-book, are *radix Sophoræ flaviscentis*, *radix ginseng*, *caules Ephedræ*, *radix Rupalix*, *Ptilycodonis*, *Epimedii*, *Ari tryphilli*, &c. These and the other remedies were found very efficacious in chronic diseases, which yielded in the usual proportion of cure and failure, and *only* in a few cases the additional aid of European remedies was to be called in. As, however, the Chinese therapeutics prescribe *larger doses*, taken several times a day, the Commission waved this, and conformed more to the rules of European medicine. Privy Councillor Horaninoff, known as a deserving author on botany and materia medica, and whose Russian works have much advanced medicine in his native country, has been commissioned to compile the volumes on Chinese botany and pharmacology, which, as they will be printed in the Offices of the Academy of Sciences of St. Petersburg, will probably be as splendid as the "*Antiquités du Bosphore Cimmerien*,"—one of the finest productions issued from

any press in modern times. Dr. Horaninoff had visited, last autumn, Berlin and London, to exhibit his *Icones Sinicae* and his drugs to the learned of both these cities. Amongst the specimens of his collection was the root of an orchidean (?) plant, which, resembling the human form, is sold, by the superstitious Chinese, at the weight of gold. It appears that they know sublimate and arsenic, but make no use of it in medicine. We may judge from their preparation of Indian ink, that they must be in possession of most curious chemical contrivances. They have no medical schools; abhor anatomy; but their medical men must, when employed by the Government or their towns, undergo an examination from their old medical authors and text books.

It cannot be doubted that the knowledge of about 600 sorts of new drugs, collected in a country extending from the tropic to the snow of the Altai, will have an influence on the condition of materia medica and medicine in general. The analogy between such an expanse of country, and the strip of tropical America, whence we have derived the Peruvian bark and balsam, sarsaparilla, &c., is still increased, if we consider that in China the experience of thousands of years is to be thrown into the scale. On the other hand, the "National Chinese Party," the offspring of European influence and initiation, are panting after European instruction and teachers. Thus, while the work of Dr. Horaninoff is in preparation, the medical men of Europe, visiting China under present emergencies, may know that they are on a spot where great sources of scientific and commercial importance are yet to be discovered.—*London Chemist, August, 1857.*

IMPORTED DRUGS.—Extract from the report on the Progress of Pharmacy made to the American Pharmaceutical Association, September 1857:

"As regards the state of the drug market, the Committee have not been able to obtain such data as will enable them to report on the general condition of the market at this time. To do this correctly, they should have access to the books of the inspectors of drugs, and be assisted by the large druggists and manufacturers, sources of information as yet but partially accessible, as business men have a strong dislike to giving statements on paper in reference to the drug trade.

The Examiner of Drugs at the port of New York, Dr. Merkle, at the solicitation of Mr. Dupuy, was so obliging as to present the Committee with a complete copy of items of drugs passed from day to day, from June 1st to August 31st, inclusive, a document of 25 pages foolscap. We have carefully condensed this list so that each drug or preparation constitutes but one item; and all the quantities of each kind, after being reduced as far as practicable to the same standard of weight, have been added together. In this way we are able to present at one view the entire drug importation at the port of New York (which embraces two-thirds of the entire amount brought into the country) during the period mentioned. We believe this catalogue, if kept up, will be a valuable appendage to the annual report on the Progress of Pharmacy. It is as follows:

Quantities of the various Drugs and Medicines that passed the Custom House at New York, during the Quarter ending August 1st, 1857.

Gum Arabic.....	63,419 lbs.	Flor. Cassiæ.....	975 lbs.
Gum Galbanum.....	1556 "	Acid. Sulphuric, Nordhausen	135 "
Rad. Ipecacuanha.....	3640 "	Tragacanth.....	4483 "
Secale Cornutum.....	2028 "	Buchu.....	4595 "
Peruvian Bark.....	125,457 "	Manna (small flake).....	120,446 "
Cream of Tartar (crys.)	421,304 "	Sem. Agni Casti.....	14 "
Opium.....	26,620 "	Senna, E. India.....	15,706 "
Colocynth.....	1297 "	Ext. Hyoscyami.....	118 "
Sulphate of Potassa.....	1476 "	Ext. Belladonna.....	66 "
Iodide of Potassium.....	6220 "	Creta Præcipitata.....	1200 "
Sugar of Milk.....	620 "	Vin. Rad. Colchici.....	50 "
Bermuda Arrow Root.....	18,883 "	Pulvis Antimonialis.....	50 "
Pulv. Rhei Borussici.....	233½ "	Syrup Rhamni Cath.....	356 "
Ol. Anisi vulgaris.....	278 "	Gum Benzoin.....	4183 "
Flores Sulphuris.....	22,304 "	Bals. Copaiba.....	{ 168 Canadas.
Verdigris.....	239 "		{ 5567 lbs.
Cap. Papaveris.....	1186 "	Cornu Cervi Rasp.....	681 "
Rad. Gentianæ.....	14,413 "	Rad. Scillæ.....	2769 lbs.
Ol. Crotonis.....	249 "	Ol. Angelicæ.....	3 "
Sulphate of Magnesia.....	53,420 "	Ol. Cardamomi.....	3 "
Supercarb. of Soda.....	1,707,100 "	Rad. Sarsaparillæ.....	119,538 "
Brown's Cantharidin Tissue	190 doz.	Cantharides.....	6455 "
Murray's Magnesia.....	60 "	Sem. Cinæ Levant.....	6416 "
Acid Tartaric, cryst.....	37,241 lbs.	Rad. Jalap.....	10,449 "
Sal Sodæ.....	5500 "	Rad. Alcanncæ.....	200 "
Potassæ Chloras.....	5816 "	Rad. Althææ.....	1153 "
Sulphate of Quinine.....	26,996 oz.	Rad. Calami.....	1625 "
Ammonia Carbonas.....	13,107 lbs.	Ol. Lauro Cerasi.....	4 "
Ammonia Murias.....	28,599 "	Ol. Menthæ Pip.....	4 "
Oleum Ricini.....	73,000 "	Ol. Amygdalæ Amaræ.....	119½ "
Baryte Sulphas.....	38,639 "	Ol. Rosarum.....	40½ oz.
Rad. Salep.....	775 "	Ol. Absinthii.....	5 lbs.
Ext. Glycyrrhiza.....	61,207 "	Ol. Millefolii, Ess.....	1 "
Acid Citricum.....	7001 "	Dr. Keeson's Ess. of Life.....	8 doz.
Fol. Sennæ Alex.....	5082 "	Ol. Succini Crude.....	667 lbs.
Seidlitz Powders.....	12 doz.	Rad. Iridis Florent.....	16,581 "
Hooper's Pills.....	84 doz.	Zinci Sulphas.....	3860 "
Crude Camphor.....	22,675 lbs.	Kousso.....	28 "
Rad. Rhei Chinensis.....	59,745 "	Lapides Cancrorum.....	6 "
Rad. Valerian.....	3835 "	Alcohol Ferri.....	10 "
Rad. Taraxaci.....	857 "	Bismuthi.....	21 "
Santonin.....	101½ "	Canada Balsam.....	4744 "
Acid Gallic.....	125½ "	Ferri Carb. Præcipitat.....	232 "
Fol. Rosmarini.....	1264 "	Vin. Sem. Colchici.....	25 "
Ol. Succini Rec.....	600 "	Sodæ acetas.....	1150 "
Ext. Cannab. Ind.....	112½ "	Flor. Malvæ arb.....	64 "
Pil Hydrargyri.....	225 "	Rad. Aconiti.....	1390 "
Cubebæ.....	3400 "	Rad. Anglicæ.....	150 "
Gambogia.....	2480 "	Bals. Tolu.....	1137 "
Sem. Anethi.....	50 "	Rad. Galangæ.....	1648 "
Ol. Sinapis.....	12 "	Rad. Turpethi.....	24 "
Ol. Carui.....	175 "	Agaricus.....	289 "
Ol. Chamomile Rom.....	3 "	Acid Acetic Crystal.....	26 "
Ol. Coriandri.....	15½ "	Flor. Rosari Rubri.....	12 "
Rad. Pareiræ Bravæ.....	491 "	Ol. Cacao Express.....	48 "

Lapis Calaminaris.....	20 lbs.	Sem. Cumini.....	1211 lbs.
Gum Anime.....	22 "	Sem. Anisi.....	944 "
Sem. Staphidis Agriæ.....	50 "	Sem. Cardamomi.....	704 "
Rad. Guaco.....	6 "	Chinoidin.....	5200 oz.
Ol. Petræ Alb.....	165 "	Sem. Coriandri.....	6000 lbs.
Tamarinds.....	329 "	Acid Valerianic.....	141 oz.
Strontia Nitras.....	380 "	Cadmium Met.....	20 lbs.
Gum Euphorbium.....	400 "	Cadmii Sulphuretum.....	10½ "
Aloes.....	3212 "	Valerianate of Ammonia.....	30 oz.
Manna (large flake).....	2542 Rottoli	Bromide of Ammonium.....	114 "
Lycopodium.....	141 lbs.	Ext. Conii.....	30 lbs.
Howard's Calomel.....	25 "	Elaterium.....	10 oz.
Emp. Adhesive.....	20 "	Ol. Lavand. Angl.....	2 lbs.
Pulv. Rhei Russici.....	5 "	Ol. Copaiba.....	10 "
Ext. Colocynth. Comp.....	41 "	Lignum Guaiaci.....	261 "
Ext. Lactucæ Viros.....	2½ "	Ol. Animalis Fœtid.....	20 "
Ext. Digitalis.....	3½ "	Ol. Animal Æther.....	1 "
Ext. Aconiti.....	10 "	Ext. Marrub. Alb.....	2 "
Confec. Sennæ.....	25 "	Ext. Krameria.....	5 "
Confec. Rosæ Gallicæ.....	25 "	Rad. Zedoaria.....	20 "
Fol. Digitalis Elect.....	247 lbs.	Sem. Cydonia.....	4 "
Fol. Conii Elect.....	25 "	Sem. Phellandria.....	10 "
Fol. Belladonnæ.....	235 "	Sem. Papaveris Alb.....	25 "
Ol. Amygdal. Dulcis.....	2004 "	Cortex Chinæ Fusca.....	6467 "
Potassæ Acetas.....	300 "	Ol. Cajuputi.....	1140 "
Bismuth. Metal.....	820 "	Ol. Baccæ Juniperi.....	156½ "
Dalby's Carminative.....	3 doz.	Ext. Rhei.....	20 "
Canella Alba.....	3357 lbs.	Amylene.....	170 oz.
Flor. Cham. Vulg.....	279 "	Zinci Valerianas.....	5 "
Pill Ferri Iodid.....	6 gross.	Ferri Valerianas.....	35 "
Cigarettes d'Espie.....	106 scatul.	Quinia Valerianas.....	1 "
Flor. Chamomil Vulg.....	162 lbs.	Ferri Lactas.....	104 "
Flora Arnica.....	417 "	Protiodide of Mercury.....	2 "
Kreasote.....	510 "	Oil of Ergot.....	203 "
Cetraria Island.....	944 "	Ferri Ammonio Citras.....	3 lbs.
Balsam Peru.....	493 "	Aconitia.....	132 grms.
Fol. Hyoscyami.....	687 "	Ferri et Quiniæ citras.....	24 oz.
Fol. Centaur. minor.....	1200 "	Iodine resublimed.....	991 lbs.
Aloes (Capensis).....	4084 "	Rad. Rhei Moscowensis.....	901½ "
Acid Acetic.....	3829 "	Chirayta.....	74 "
Calomel.....	450 "	Glycerin.....	716 "
Ext. Taraxaci.....	240 "	Nux Vomica.....	10,800 "
Ext. Rad. Aconiti.....	5 "	Flores Sambuci.....	521 "
Uva Ursi.....	1606 "	Thymus Vulg.....	212 "
Flor. Tiliæ.....	391 "	Rad. Saponaria.....	328 "
Fol. Aconiti.....	130 "	Cortex Curacoæ.....	323 "
Rad. Glycyrrhiza.....	4261 lbs.	Flor. Papaveris.....	105 "
Ol. Origan.....	2353½ "	Flor. Viola.....	105 "
Ol. Sabine.....	94½ "	Labdanum.....	25 "
Henry's Magnesia.....	36 gross.	Sagapenum.....	25 "
Crocus Orientalis.....	1 lb.	Tacamaca.....	31½ "
Resinæ Jalapæ.....	3 "	Ext. Sarsap. Com.....	2 "
Ol. Calami.....	6 "	Ext. Colchici acet.....	1 "
Moschus Tonquin.....	45½ oz.	Ol. Cumini vol.....	20 "
Magnesia Carbonat.....	7525 lbs.	Magnes. Citras Efferves.....	161 doz.
Magnesia Calcinat.....	61,566 "	Nitrate of Soda.....	102,700 lbs.
Ol. Melissa.....	11 "	Acid Boracic.....	95,455 "
Ol. Valerianæ.....	10 "	Codeia.....	4 dr.
Assafetida.....	7270 "	Manganessii Sulphas.....	12 lbs.

Manganesii Hydriodas.....	15 oz.	Conia.....	2 oz.
Manganesii Citras.....	15 "	Dipple's Animal Oil.....	12 lbs.
Zinci Chlorid. Sicc.....	100 "	Pepsin.....	4 oz.
Sulphate of Cadmium.....	15 "	Hippuric Acid.....	4 "
Iodide of Cadmium.....	20 "	Digitalin.....	4 "
Bromide of Cadmium.....	10 "	Salicin.....	112½ lbs.
Caffein.....	1½ "	Bacc. Juniperi.....	97 "
Iodide of Ammonium.....	25 "	Rosa Gallica.....	3 "
Acid Phosphoric Glac.....	46 "	Coal Naptha.....	50 "
Plumbi Acet. Pur.....	10 lbs.	Beeberin.....	1 oz.
Sal Rochelle.....	1950 "	Gauza.....	227 lbs.
Fol. Salviæ.....	708 "	Ol. Sabinæ Vera.....	150 oz.
Rad. Hellebori.....	492 "	Oxide of Copper.....	50 lbs.
Rad. Colombæ.....	10,300 "	Oxide of Uranium.....	25 "
Acid Benzoic.....	200 "	Gum Olibanum.....	1200 "
Storax.....	520 "	Ext. Valerian Rad.....	2 "
Lactucarium (German).....	8½ "	Pulv. Rad. Scillæ.....	5 "
Morphia Sulphas.....	12½ "	Price's Glycerin.....	200 "
Strychnia Cryst. Pur.....	22¼ "	Bi-carb. Potassæ.....	50 "
Chloroform.....	81 "	Zinci Oxidum Purum.....	25 "
Ergotin.....	1 "	Baryta Nitras.....	431 "
Cowhage.....	21 "	Rad. Zing. Jam.....	5200 "
Alcohol Absolute.....	56½ "	Ol. Geranii.....	50 "

List of Drugs, etc., rejected by the Examiner at N. Y., during the same period.

Lac Sulphuris.....	5 casks.	Carbonate & Calcined Mag- nesia.....	16 cases.
Flores Sulphuris (contained Arsenic).....	84 "	East India Rhubarb.....	53 "
Gum Arabic.....	4 cases.	Peruvian Bark.....	5 seroons
		Ipecacuanha.....	1 bale.

THE SALE OF POISONS BY APOTHECARIES AND DRUGGISTS.—The following Report from the Censors of the College of Physicians was presented to the College at the *Comitia Majora*, on Thursday, June 25 :—

"At the end of a year of visitation, the Censors having inspected, as they believe, every shop in the city, have the satisfaction of reporting that improvement is gradually taking place in all the Apothecaries' shops within their appointed district. In many instances they have had occasion to express their marked approbation, and have found much to commend in nearly all. The Censors have especially directed their attention to the care taken of poisonous drugs, and the method of their sale. They again found occasion to commend many methodical attempts to indicate poisonous drugs, so as to avoid accidents in dispensing them. They consider, however, that the extension of sound chemical knowledge among the Druggists and dispensers of medicines would be the most effective safeguard against accident; and, as regards the public, they consider that a wider knowledge of the nature of poisons and their effects, and the certainty of their detection when administered, would tend most effectually to restrain both the criminal and the careless use of them.

(Signed)

JAMES ALDERSON,
WILLIAM A. GUY,
PATRICK BLACK,
HENRY PITMAN,

Censors."

Royal College of Physicians, June 25, 1857.

London Pharm. Journal.

Minutes of the Philadelphia College of Pharmacy.

The Semi-Annual meeting was held at the College Hall, 9th mo. 28th, 1857.

The first Vice President, S. F. TROTH, in the Chair.

The Minutes of the last stated and special meetings were adopted.

By the minutes of the Board of Trustees, which were read, it appears that George Blinkhorn has taken the degree of Graduate in Pharmacy in compliance with the requisitions.

Charles Shivers, recommended to membership by the Board of Trustees, was now on ballot unanimously elected a resident member.

The Committee appointed on the proposition to unite with the Board of Trade were continued.

The Committee on the alteration of the College building, made a report detailing the improvements accomplished, the expense incurred and the methods adopted for raising the funds; by this it appears that the building has been thoroughly repaired and painted, inside and out, the first story has been papered and varnished, the second story much improved, and a new and complete Lecture room fitted up in the third story; the stairway formerly leading from the south end of the building against the western wall to the fourth story has been removed, and the well obliterated in the third story, and in the second and first stories converted into small rooms communicating with the lecture and meeting rooms, the former serving as a large closet for the use of the Professors of Chemistry and Pharmacy, and by a division midway between the floor and ceiling furnishing a place for the storage of the stock of Journals on hand. The stairway on the east side of the building has been carried up to the fourth story.

Most of the expense, which reaches about \$900, has been provided for, by a loan for not more than two years without interest, taken by members of the College in shares of \$25.

The Report of the Committee was accepted, and, on motion, the Committee on Latin Labels and the Publication Committee were each instructed to pay over \$150 to enable the Committee on the alterations to meet the remainder of their indebtedness.

The delegates to the American Pharmaceutical Association reported as follows:

The undersigned, delegates elected to attend the meeting of the American Pharmaceutical Association, report that they have attended to the duty, and that the meeting took place in the Hall of the College on the 8th, 9th, 10th and 11th of the present month. The attendance was larger than ever before, reaching 75 members; the business was conducted with much harmony, and several interesting papers on scientific subjects were read. The subjects of the Sale of Poisons, of Weights and Measures, and the Progress of Pharmacy during the past year, were reported on by Com-

mittees. The revision of the Pharmacopœia was discussed and provided for, and various scientific subjects were reported on by individuals to whom they had been referred. The members in attendance generally expressed themselves gratified with the results of the meeting, and the weather proving fine, added not a little to the satisfaction of all concerned. Appended to this report is a copy of the Minutes of the meeting as they will appear in the *American Journal of Pharmacy* for November. The undersigned, in common with other members of the Association, partook of the elegant entertainment provided by the Local Committee of this College, in the College Hall, and were gratified with the manner in which it was conducted. The report of the Local Committee will doubtless give a full account of this part of the history of the Association meeting.

Signed by the Delegates.

The services of the Local Committee were spoken of with approval by several of the members, and a unanimous vote of thanks adopted by the Board of Trustees was directed to be entered on the Minutes of the College.

The following report of the Committee on the Sinking Fund was read :

In the Fall of 1846 the Finance Committee having concluded its arduous duty, of reducing the debt of the College from seven thousand and eight hundred dollars to three thousand dollars, a Committee of three members was appointed to be called the Committee on the Sinking Fund, whose duty it was to invest such sums as might from time to time be placed at their disposal in the purchase of the remaining debt of the College. This Committee for the past ten years has annually reported its proceedings to the College at its stated meetings in the 3d month, but has never had its accounts examined.

Having at length the pleasure of communicating to this body that they believe they have faithfully accomplished the object of their appointment, having this summer paid off the last share of loan created in the year 1832 to build the Hall on Zane street, they herewith hand an account of their receipts and disbursements, and ask that a Committee may be appointed to examine and settle the same.

They also offer the following :—

Resolved, That a Committee on the Sinking Fund be continued, and annually appointed to receive and invest such sums as may from time to time be placed at their disposal from the proceeds of Latin Labels, Patent Medicine Directions and other sources, and apply it in the first place to paying off the debt of the College created this summer for repairs and improvements to the building ; and in the second place to invest in good and safe securities, for the purpose of creating a fund to pay off the ground rent still remaining on the College Hall.

SAMUEL F. TROTH,
AMBROSE SMITH,
EDWARD PARRISH.

Philadelphia, 9th month 22d, 1857.

On motion, the report was accepted, and the resolution contained in it was adopted.

Thomas P. James and Robert Bridges were appointed to audit the accounts of this Committee to this date.

The following resolution, offered by Prof. Thomas, was unanimously adopted, directed to be engrossed, signed by the President and Secretary, and presented to the Chairman of the Sinking Fund Committee :

Resolved, That Samuel F. Troth, by his zealous and successful labors as member of the Finance Committee appointed in 1844 to endeavor to relieve this College of its then existing embarrassments, and by his faithful and efficient discharge of the duties of Chairman of the Committee on Sinking Fund appointed in 1847, under whose auspices the onerous debt contracted for the erection of the Hall in Zane street has been finally extinguished, merits and is hereby unanimously tendered the thanks of this College.

On motion it was Resolved, That, for the purpose of closing the accounts of the Sinking Fund Committee to the present time, the one hundred dollars loaned by said Committee to the general account be transferred to the Treasury of the College.

On motion it was Resolved, that the Treasurer be instructed to make an additional insurance of \$3000 on the Hall, selecting some other office than that now insured in. S. F. Troth was appointed to aid the Treasurer therein.

A resignation of membership was received from Henry M. Troth, who is about to remove from the city. The required information being received from the Treasurer, the resignation was accepted.

William Biddle having retired from the pharmaceutical profession, after having been a resident member of this College for thirty-one years, and also having presented the sinking fund with fifty dollars, it was unanimously resolved that he be elected a life member of the Philadelphia College of Pharmacy.

Dr. John Harris having also retired from the profession, requested through the Treasurer to resign his membership; and in consideration of his faithful service during a series of years, his certificate of membership was voted to him and his resignation accepted.

The following members having either removed from the city or being in arrears for at least two years previous to the current year, it was resolved that their names be stricken from the Roll, and that they be requested to return their certificates of membership to the Treasurer: H. W. Worthington, Charles H. Dingee, Francis Zerman, Claudius B. Linn, Benjamin R. Smith, Jos. A. McMakin, Charles S. Rand.

Prof. Thomas presented the College with a bust of Prof. Geo. B. Wood, in plaster, to be placed as an ornament in the Hall. On motion a vote of thanks was tendered him.

The semi-annual election was held, which resulted in the choice of the following members to the Board of Trustees:

T. P. James,
Jacob L. Smith,
A. B. Taylor,
E. T. Ellis,

W. J. Jenks,
S. S. Garrigues,
W. H. Pile,
C. Bullock.

Then adjourned.

EDWARD PARRISH, *Secretary*.

Editorial Department.

THE LATE MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—Our readers will find a full account of the Proceedings of the Association at its recent meeting in this city, with several of the papers read during the sessions, in the preceding pages of this number. The occasion was marked with more than ordinary interest, the attendance being quite numerous, representing the States of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, Ohio, Michigan and Illinois. Good feeling prevailed during the several sittings, and nothing occurred to mar the interest of the members. After the adjournment, the strangers present were invited to partake in an excursion to Fairmount, Laurel Hill and the Wissahickon in the afternoon, and an entertainment was given to them in the evening at the College Hall under the superintendence of the Local Committee, which passed off pleasantly.

We take advantage of this opportunity to state that the "Proceedings" of the Association, published by its authority by the Executive Committee, is now ready for the members, and is a volume of 180 pages, octavo. The Committee have had a number of copies bound, so as to be more readily preserved, and as the work contains several valuable papers it is well worth a place in every pharmaceutical library. The price of the work in paper cover, is 24 cents, the postage on it 9 cents. The price, bound, is 39 cents, and postage 15 cents. These prices merely cover the cost. All who want copies can get them by enclosing 11 letter stamps for the unbound, and 18 letter stamps for the bound copies, directed to the Chairman of the Executive Committee, Samuel S. Garrigue, 108 north 5th street, Philada.

COMPOUND SYRUP OF PHOSPHATES, OR CHEMICAL FOOD.—Several years ago, Dr. Samuel Jackson, of the University of Pennsylvania, introduced a prescription of the phosphates of iron, lime, soda and potassa, which was considerably prescribed at that time by himself and some other physicians, in solution by aid of an excess of phosphoric acid. The proportion of ingredients have varied, and the manner of making the solution—sometimes phosphoric acid and sometimes muriatic and lactic acids being employed as the solvents. The favorable results from the use of the phosphates so combined gradually led to their being made into a comparatively permanent compound syrup, first by Durand & Tourtelot, and subsequently by H. C. Blair & Co., and others. The last named firm claim for their syrup the approval of Professor Jackson, and we had hoped to have been able to give to our readers the formula for its preparation; but as they decline making it public, we have availed ourselves of the recipe of our friend Edward Parrish, who has communicated at our solicitation the following recipe. Whatever difference there may be between these formulæ, we believe it has reference almost entirely to the *modus operandi* and the unes-

sential ingredients, and not to the proportion of phosphates in any important degree ; and hence we feel confidence in publishing this recipe :

Chemical Food.

Take of Protosulphate of Iron	℥x.
Phosphate of Soda	℥xij.
Phosphate of Lime	℥xij.
Phosphoric Acid, glacial	℥xx.
Carbonate of Soda	℔ij.
Carbonate of Potassa	℔i.
Muriatic Acid	} of each sufficient
Water of Ammonia	
Powdered Cochineal	℥ij.
Water, sufficient to make	℔℥xx.
Sugar	lb. iij. (Troy.)
Oil of Orange	m. x.

Dissolve the sulphate of iron in f.℥ij. of boiling water, and the phosphate of soda in f.℥iv. of boiling water. Mix the solutions, and wash the precipitated phosphate of iron till the washings are tasteless.

Dissolve the phosphate of lime in four fluidounces of boiling water with sufficient muriatic acid to make a clear solution, precipitate it with water of ammonia, and wash the precipitate.

To the freshly precipitated phosphates as thus prepared, add the phosphoric acid previously dissolved in the water. When clear add the carbonates of soda and potassa, and afterwards sufficient muriatic acid to dissolve the precipitate.

Now add the cochineal mixed with the sugar, apply heat, and when the syrup is formed strain and flavor it.

Each teaspoonful contains about 1 grain of phosphate of iron and $2\frac{1}{2}$ grains of phosphate of lime, with smaller proportions of the alkaline phosphates, all in perfect solution.

POWDERED EXTRACT OF HYOSCYAMUS.—We have received the following letter on this subject :—

Cincinnati, September 21st, 1857.

To the Editor of the American Journal of Pharmacy :

SIR,—The extracts of hyoscyamus, belladonna, conium mac., etc., if carefully dried at a heat not exceeding 212 or 215 degrees F. and pulverized, will, (especially the first), no matter how carefully corked when used, attract moisture from the air, and become too soft for powders and too tough for any other use. How can this be prevented? Are those extracts proper articles to be prescribed in and for powders, which is often done?

As other druggists may have suffered from the same cause, it might not be unwelcome if you would, in the "Journal," give proper information.

Respectfully,

CHAS. A. JUNGHANNS.

The usual course pursued is to triturate the extract with sugar or other inert powder, if no others are associated in sufficient quantity to give the requisite dryness to the mixture. The object of our correspondent could probably be attained best by treating the Extract of Hyoscyamus with alcohol till exhausted, and evaporate the alcoholic solution to dryness, and then adding as much pure cane or milk sugar as will make up the original weight of the extract in its normal condition, and triturate to a uniform powder.

The hygroscopic tendency of the extract of hyoseyamus is probably due to the natural saline matter of the plant, of which it contains about seven per cent., and which is partly extracted in the juice and remains in the extract.

FLUID EXTRACT OF BARK.—The following letter has been received from our old correspondent :—

Baltimore, Md., September 22th, 1857.

To the Editor of the Journal of Pharmacy :

DEAR SIR,—In preparing some fluid extract of Calisaya bark I thought proper to vary the usual process, expecting to procure a prettier pharmaceutical preparation, and succeeded, unless the preparation has impaired the powers of the drug. The bark was pulverized and packed lightly in a funnel percolator, the powder previously moistened with 95° alcohol. The active principle was exhausted by continuous additions of the spirit. The percolation was then continued with water. The two percolates were mixed and evaporated to the proper quantity; this being cloudy, from the resinous matter precipitated by the addition of the aqueous infusion and evaporation of the spirits, *was strained*. The sugar was then added in the proportion indicated by Alfred B. Taylor's formula. Heat from a water bath was continued a short time and the fluid extract was finished. The resulting preparation is very pretty. The gummy and resinoid residuum strained from the evaporated percolate is of a dark brown color, having little or no taste, and is, as I conceive, a foreign matter, which may be removed without impairing the integrity of the preparation.

I have submitted this matter to your consideration for the benefit I may obtain from any editorial remarks you may think proper to make.

Enclosed is a sample of the residuum obtained by the straining.

Respectfully yours,

LÆNO.

"Læno" has fallen into the common error of supposing that because the precipitate from tincture of cinchonia by evaporation is insoluble and tasteless, it must be inert; whereas it contains a considerable percentage of cinchotannate of quinia and cinchonia, as a few drops of diluted muriatic acid added to the "residuum," of which he sent us a sample, would convince him if tasted. Mr. Taylor was well aware of the value of this precipitate in suggesting the formula, and hence left it in the preparation, to which, though detracting from its beauty, it gives additional medical value. If the fluid extract is made with a small excess of muriatic or sulphuric acid, as suggested by I. C. Jones, a clear preparation is afforded, but the natural alkaloidal salts are decomposed and the extract is much more bitter.

TÆNIA SOLIUM.—We publish the following narrative, though not strictly within our province, because in some of its details it may prove useful, as suggested by the author.

New York, October, 1857.

To the Editor of the American Journal of Pharmacy.

DEAR SIR,—The subject about which I address you will, no doubt, seem to you very strange, perhaps incredible; but believe me, I shall give nothing but plain facts, just as they occurred; and, if you think the subject worthy of the space in your journal, they may, perhaps, be of benefit to physicians treating cases similar to mine. In 1849 I went to California; in 1850, one morning, in having a passage of the bowels, I noticed several small worms in the excrement, (I forgot to mention I am a druggist, have

been in the business over 13 years,) and in returning to the store I took a bottle of vermifuge without any benefit. One week afterwards I took two bottles at a dose; it relieved me for about two weeks. Then I took large doses of calomel followed by castor oil; they only furnished temporary relief; consulted several of the best doctors; one recommended injections five or six times a day, all without relief; in fact, up to 1854, I consulted, I suppose, thirty different M. D.s showed them the worms, which had increased to such an extent that they would pass off in my pants. Some days I suppose I passed forty about an inch long; some days, perhaps, not more than twelve. The latter part of 1854, in having a passage, I had a queer feeling at the anus, and I found a worm had made his appearance. I commenced pulling, and pulled until I fainted away with fright, (and I am not easily frightened,) but I caved that time, sure. When I came to, I found my hand filled with I didn't know what, but I again pulled, until I could pull no more. I pulled much harder and it broke. I did it up in a newspaper, took it to the store (we had an M. D. at the store) and learnt that it was a tape worm. I washed it, then measured it, found it to be 32 feet; it seemed very elastic. I think by a little pulling it would have measured 40 feet. I preserved it in alcohol, and I suppose it is still in my old store in San Francisco. This did not decrease the passing of worms in my clothes. In 1855 I started for New York, via Nicaragua, per steamer Cortes, (on other side,) steamer Northern Light on this side; we stopped at Key West to coal. We got in a little before daylight, and about daybreak I had an operation on the beach. I again found it to be principally worms. I examined it, and it was between eighteen and twenty-five feet in length, all one piece. Persons troubled with tape worms are generally great eaters; this, Mr. Editor, was not the case with me; my *friend* seemed to want only liquid stimulants; some days I would drink twenty glasses of brandy and water, the average of brandy about three ounces to the drink, and be perfectly sober all day, (at the present, six such drinks would keep me drunk all day long.) The last worm, of course, I had no chance of preserving. I got to New York, went west, from thence south to New Orleans, took a clerkship in a drug store, (all the while having daily and nightly passages of that disagreeable friend). I consulted some of the best M. D.s of New Orleans; one, after several different treatments, without any favorable result, recommended the great remedy (described in Pereira's works) called Cusso or Kouso. I used two ounces, but with no relief. I could not keep from drinking my regular quantity of liquor every day. The latter part of 1856 I left New Orleans and came to New York, and took a clerkship where I could not go out and get drinks when I required them. I was often obliged to take a drink of Tr. Gent. Comp., Tr. Colombo, &c.; also other bitter tinctures; the alcohol they contained seemed to satiate my appetite. I now found when I drank these tonics, that the worms passed much more frequently. I again consulted another physician; he recommended half an ounce of turpentine, followed by castor oil, which relieved me for about a week (I repeated the dose three successive days). I had about given up that my case could not be cured, when one evening I argued the matter with myself, and I thought of treating the case mechanically. I will give you my process, which has succeeded, at least this is my opinion, it being a little over six months since I parted with my old companion (I call him so, he having been with me about seven years). I made up two gallons Tr. Gent. Co., and Tr. Colombo, (one gallon of each, then mixed,) U. S. Dispensatory. Drank it when I wanted stimulants, perhaps eight to twelve drinks per day, from two to three ounces per drink, (eat scarcely anything but a little soup); at the end of a week I found the worm was getting sick of his diet. They passed off quite freely. Now I took a sixteen ounce syringe, filled it with warm milk and

sugar, took the injection, retained it fully two hours; when it passed off the worm started; I again received over fifteen feet, but before I could pull it all he had fastened. I could feel that it was in the lower intestines, so I did not break it but held on. I poured out two ounces (fluid) spirits of turpentine, took it with one ounce of castor oil, sat down in a chair for over two hours, (still retaining the worm so as to prevent his going higher) in a little over two hours the medicine operated, and my friend had got sick of turpentine, and he passed off with the greatest ease, in all, a little less than eighteen feet. Fearing there might still be some remains of him, the next day I took one ounce of turpentine followed by oil. This was last April, and I have not felt the least symptoms of the worm since. I should have written to you ere this, but I always doubted my success, for I expected every day that I would again pass links of the worm; but now I am satisfied that my plan was successful. You will see how I starved and sickened the worm in the stomach, (where no doubt he was fastened) and then fed him on milk and sugar so as to coax him down, but he seemed too well pleased with his old quarters. When he found he was passing off, he made another desperate grip; in pulling a little I could feel it sensibly that it was quite low, full as low as where the milk must have reached, but the turpentine, I suppose, he could not stand, it being a large dose. Well, he is gone, and I do think I never parted with an old companion with greater pleasure. Some doctors may say I didn't follow their directions; but believe me, all the doctors under whose treatment I have been, have had their directions strictly adhered to. Many M. D.s will remember my case, and I am sure would be glad to learn how I was cured. I am now in good health and spirits. I forgot to mention, during the whole worm season, I never could get sleep enough; always felt sleepy. I have but a moderate appetite for drink now, in fact, I feel like a new man.

I have examined the links of the worm through a microscope. I find each link is a separate worm, but they hold on so firm you are just as apt to split one in two as to separate them by the joints. I send this for the reason that I found, in fact, every doctor that I applied to seemed to know but little, if any thing, about the treatment of tapeworm. Hoping this may be of benefit to unfortunate individuals who may be suffering what I have suffered, and perhaps to the faculty at large,

I remain yours,

L.

The Hand-Book of Practical Receipts, of every day use; a manual for the chemist, druggist, medical practitioner, manufacturer, and heads of families; comprising the officinal medicines, their uses and modes of preparation; and formulæ for trade preparations, mineral waters, powders, beverages, dietetic articles, perfumery, cosmetics, etc. A glossary of the terms used in chemistry and medicine, including old names, contractions, vulgar and scientific demonstrations; with a copious index to all the preparations. By THOMAS F. BRANSTON. First American from the 2d London Edition. Philad'a: Lindsay & Blakiston, 1857. pp. 307.

The above title page sets forth the contents of the volume so fully that it is unnecessary for us to reiterate them. The Hand-book appears to be as well selected as the generality of works of the kind, and embraces many useful recipes that will more than repay the cost of the book to those that need them;—and more also that are of less value. Although of moderate size, it comprehends a great variety of recipes in medicine, of the arts and domestic economy.

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